state enhancement grant assessments and strategies

CUMULATIVE and SECONDARY IMPACTS

NOAA / **NOS** / Office of Ocean and Coastal Resource Management

Coastal Programs Division

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Overview

This report describes the changes to state, territory and commonwealth coastal zone management (CZM) programs that assess and control cumulative and secondary impacts that were completed or initiated during the timeframe of Federal fiscal years 1992-1996. These changes were characterized by the States in the last round of Assessments, which were submitted to OCRM in February of 1997. If Strategies were developed for cumulative and secondary impacts, the planned activities are also summarized.

The development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of growth and development in coastal areas are important tools in achieving this goal. Identifying areas in the coastal zone which possess sensitive resources or where rapid growth or changes in land use require increased protection or improved management is a primary objective of state and territorial CZM programs.

The National Coastal Zone Management Program (CZMP) is a voluntary partnership between the Federal government and the 35 U.S. coastal states, territories, and commonwealths authorized by the CZMA to:

> *- Preserve, protect, develop, and where possible, restore and enhance the resources of the Nation's coastal zone for this and succeeding generations;*
>
> *- Encourage and assist the States to exercise effectively their responsibilities in the coastal zone to achieve wise use of land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and esthetic values as well as the needs for compatible economic development;*
>
> *- Encourage the preparation of special area management plans to provide increased specificity in protecting significant natural resources, reasonable coastal-dependent economic growth, improved protection of life and property in hazardous areas and improved predictability in governmental decision-making; and*
>
> *- Encourage the participation, cooperation, and coordination of the public, Federal, State, local, interstate and regional agencies, and governments affecting the coastal zone.*

In the 1990 reauthorization of the CZMA, Section 309 was amended to create the Coastal Zone Enhancement Program. Its intent was to provide incentives to States to make improvements to their coastal programs in any of eight areas of national significance (a ninth was added in 1996), including cumulative and secondary impacts. As a part of the Section 309 grant process, periodically all the coastal programs must develop Assessments — a critical examination of each of the nine enhancement areas. The Assessments provide a comprehensive review of activities previously performed by the CZM program (with particular emphasis on 309-funded efforts), identify specific impediments or needs, and present a general characterization of the adequacy of the State's management framework for that area. The Assessments conclude with a ranking of the area as high, medium, or low, based on its importance in the State; the need to improve the State's ability to manage the area, and the suitability of using the Section 309 program as the means to address it. For those issues ranked as a high priority for Section 309 purposes, States develop multi-year Strategies, laying out a framework for activity and funding levels which, at the project's conclusion, should lead the State to specific program changes' that also are defined.

Improvements to state coastal programs are generally intended to encompass new or strengthened laws, regulations, or other enforceable policies at the state (and local) level. In the case of cumulative and secondary impacts, states and territories are encouraged to adopt program changes through the development, revision or enhancement of procedures and policies that assess, consider, and control cumulative and secondary impacts of coastal growth and development on coastal resources, such as coastal wetlands and fishery resources.

The report is broken down into four parts. The first section contains state-specific summaries, organized by Region. The summaries generally characterize the cumulative and secondary impacts issue; briefly outline the activities undertaken/initiated between 1992 and 1996 (highlighting those that were 309-funded); identify obstacles to assessing and controlling cumulative and secondary impacts and the need for specific refinements to improve the assessment; and if applicable, detail the State's strategy for achieving those improvements (or other planned activities). A State contact is included for the purposes of obtaining additional information.

The second section compiles the cumulative and secondary impacts activities for all the states, and if applicable, their Strategies, and reorganizes them into seven general areas of management: (1) assessment; (2) planning; (3) information management; (4) technical assistance; (5) regulatory controls; (6) non-regulatory controls; and (7) coordination and reorganization. These categories are further broken down as appropriate, and similar activities are grouped accordingly.

The third section pertains to obstacles and needs. Brief descriptions of impediments to or areas for improvement in achieving improved assessment and control of cumulative and secondary impacts were compiled from the Assessments and broadly grouped by issue, which are also characterized.

The report concludes with a table which provides a snapshot of the overall distribution of cumulative and secondary impacts projects by State and type, including distinguishing between Section 309-funded and non-309 funded.

Patricia Dornbusch and Joseph Flanagan of NOAA's National Ocean Service compiled the information found in this report. ***Kristine Schlotzhauer*** *provided editorial and design support. For further information or additional copies of this report, please contact Joseph Flanagan at (301) 713-3121 x201 or joseph.flanagan@noaa.gov.*

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Connecticut

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

Growth of coastal areas in Connecticut over the past several years has not been especially rapid, although the state's coast has been heavily populated and developed for most of this century. Moreover, the state' s economy has not yet recovered completely from a recent deep recession, so growth that has occurred in the past six to eight years has been mostly infill and redevelopment. Resources such as tidal wetland systems, submerged aquatic vegetation, and shellfish beds are given special attention and protection from cumulative and secondary impacts in planning and permitting decisions.

State Activities 1992 to 1996

Planning (National Estuary Program): The Long Island Sound National Estuary Program (NEP) Comprehensive Conservation and Management Plan was issued in March 1994. The plan identified six priority issues and suggested policies and procedures to address them.

Assessment (boundary review): A boundary review undertaken as part of the coastal nonpoint program development resulted in a management area beyond the coastal zone boundary and consideration of future expansion of the coastal area up the Connecticut River. **(Section 309)**

Planning (watershed planning): An ongoing watershed planning initiative will result in a reorientation and coordination of planning and regulatory programs along watershed boundaries. Two pilot watershed management planning studies are underway.

Information management (GIS and database): Geographic Information Systems (GIS) and database projects for regulatory and resource information have been developed.

Contact:
Charles H. Evans, Director
Department of Environmental Protection
79 Elm Street
Hartford, CT 06106-5127
Phone: 860.424.3034
Fax: 860.424.4054
E-mail: charles.evans@po.state.ct.us

Obstacles/Needs

Information needs: The most significant need is not for additional regulatory authority but for development and dissemination of additional information based on GIS and other data capabilities and focusing on sensitive resources, activities with high potential to cause cumulative impacts, and locations where the combination of resources and activities requires more targeted management.

Need for methodologies: Resource information systems that would permit a more sophisticated management approach than simply to avoid, minimize, and mitigate each incremental impact.

Program integration: Continued work is needed on integrating nonpoint source pollution control into ongoing programs.

Summary of Strategy

Connecticut's strategy is to fine tune existing programs and make use of available GIS and resource information technology. Specific projects will include research and analysis on new opportunities in cumulative impact assessment, with the goal of utilizing such assessments in areas and jurisdictions especially subject to cumulative and secondary impacts because sensitive resources, harmful activities, or both, are present.

Delaware

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

Cumulative and secondary impacts are of most concern to the state of Delaware in smaller coastal communities, which generally lack sufficient infrastructure to accommodate uncontrolled and unplanned growth. Smaller communities also lack the policy mechanisms to establish and administer local land use controls.

State Activities 1992 to 1996

Assessment (impact assessment): An intensive modeling effort was undertaken for the Dover Silver Lake watershed to evaluate the effects of land use on pollutant inputs. Consisting of a Geographic Information System (GIS) interface with a stormwater management model, this effort will allow local land use planners to assess effects of land use decisions within a watershed more scientifically and provide them with more information on which to base decisions. **(Section 309)**

Information management (database development): Other database projects include spatial tracking of federal consistency certifications and determinations and development of Coastal Ocean Management, Planning and Assessment System Delaware, which will allow managers to bring disparate coastal resource data into a single desktop system for comparison, display, and analysis.

Planning (watershed management): A Whole Basin Approach to watershed management is being developed and will look sequentially at the five major basins in Delaware and provide a framework in which to evaluate watershed health and activities.

Planning (National Estuary Program): The Comprehensive Conservation and Management Plan for the Delaware National Estuary Program was recently adopted.

Obstacles/Needs

Inadequate infrastructure: Lack of sufficient infrastructure in small coastal communities to accommodate growth.

Inadequate land use controls: Lack of adequate land use controls and other planning mechanisms to accommodate and control growth.

Summary of Strategy

Goals of the Delaware strategy for cumulative and secondary impacts include:

Assessment (impact assessment): improving analytical and decision support tools for Delaware River and Bay dredging projects and enhancing the beneficial use of dredged material;

Technical assistance: providing technical assessment capabilities for local governments to assist them with development of land use management plans that have resource protection and restoration as primary objectives;

Planning (watershed management): supporting the state's Whole Basin Management Approach;

Technical Assistance (public education): developing a public participation and technical assistance program for groups with vested interest in ecosystem protection and development.

Contact:
Sarah Cooksey or David Carter
Delaware Coastal Management Program
89 Kings Highway, P.O. Box 1401
Dover, DE 19901
Phone: 302-739-3451
FAX: 302-739-2048
E-MAIL: scooksey@state.de.us
dcarter@state.de.us

Maine

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

Concern about sprawling development is particularly pressing in coastal regions of Maine. The greater Portland region is one of the state's fastest growing. The islands of the Maine coast have also seen intense development pressure. Recent statistics show significant increases in island vacation homes, ferry ridership during summer months, and island visits by recreational boaters. Although the state has made great strides in addressing certain environmental impacts associated with development, some of the more diffuse sources of pollution have not been effectively addressed, including runoff from roads, erosion from construction activities, and wastewater discharges from shoreland septic systems. A related concern is the incremental loss and fragmentation of important wildlife and plant habitat resulting from residential and commercial development in coastal communities.

State Activities 1992 to 1996

Planning (watershed management): The Maine coastal program initiated efforts in 1992 to encourage cities and towns to work together to understand the cumulative impacts of development in a regional context and improve the management of shared coastal resources, such as estuaries. A three-year demonstration project was funded in the Damariscotta River Estuary, which resulted in a management plan detailing fifty actions to sustain the high quality of the estuary and its watershed. These actions are now being implemented by a new planning alliance formed by the planning boards of the seven municipalities. **(Section 309)**

Planning (National Estuary Program): The Casco Bay National Estuary Program (NEP) is a much larger initiative also concerned with the cumulative impacts of development on coastal resources. The Casco Bay project is a collaborative effort between federal, state, and local governments, businesses, and local environmental groups. The management plan for the estuary was completed in 1996.

Technical Assistance (Citizen's Guide): The Maine coastal program has also begun to help volunteer citizen groups identify and address pollution sources in coastal watersheds, by publishing a citizen's guide to coastal watershed surveys.

Regulatory controls: The jurisdiction of the Maine Site Location of Development Law was changed in 1996 to decrease the state's role in permitting mid-sized development projects and increasing municipal responsibility for review of these projects. The legislature also enacted two new statutes strengthening the state's ability to address erosion control and stormwater management for new development. Other regulatory changes included addition of the state Endangered Species Act, which requires state approval for any project near designated essential habitat for an endangered species, to the core authorities of the coastal program, and changes to state Guidelines for Municipal Shoreland Zoning Ordinances.

Obstacles/Needs

Research needs: Effectiveness of Best Management Practices that control stormwater quality has not been tested in Maine.

Need for new management approaches: The current approach to managing development, relying on town-by-town planning and regulating individual projects, is limited in its ability to deal with cumulative impacts of development on a watershed scale. The state lacks guidance to consider past and future development in a coastal town or watershed when permitting a specific development project. State needs to develop a watershed-based program that links towns and people with the information they need.

Need for local capacity building: Many of Maine's coastal municipalities lack the technical capacity to manage growth and regulate development—need training, information, and personnel to conduct technical reviews of development projects.

Summary of Strategy

Maine's CSI strategy includes efforts in three categories: state regulation of land uses, watershed management, and municipal capacity to control development. The state's goals include encouraging and supporting cooperative state and municipal management of coastal resources; protecting and managing critical habitat and natural areas of state and national significance and scenic beauty; ensuring protection of land and water resources and ecological systems; ensuring that all municipal leaders have the tools and assistance they need to make fiscally and environmentally sound decisions that support local and state land use and infrastructure policy; and ensuring that Maine will have a healthy and productive marine ecosystem.

Regulatory controls: Specific regulatory changes that will be pursued include creating administrative procedures and guidance to implement new laws for erosion and sedimentation control and stormwater management.

Planning (watershed management): The state is also embarking on a larger effort to create coalitions among local and regional groups to better address existing and potential natural resource problems in priority watersheds in the state. Program changes may include new guidelines and procedures to direct collaboration between state agencies on watershed projects; new or revised local ordinances that are more consistent and improve resource protection; new watershed organizations; and new funding sources.

To complement the watershed effort, the coastal program plans to organize teams of state agency staff from various departments to serve as a clearinghouse and single point of contact for local groups to obtain assistance in data, maps, and other natural resource information, state and federal technical and financial assistance, and volunteer training.

Technical assistance (building local capacity): To enhance municipal capacity to manage development, the state will implement municipal technical assistance through workshops and training, resource materials, and an interagency technical assistance response team. The Maine Coastal Program will also encourage community dialogues about loss of community character and traditional economies and implementation strategies to revitalize regional service center communities.

Contact:
Kathleen Leyden
State Planning Office
State House Station #38
184 State Street
Augusta, ME 04333
Phone: 207.287.8062
Fax: 207.287.8059
E-mail: kathleenleyden@state.me.us

Maryland

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

Between 1990 and 2020, population in Maryland is expected to increase by 28 percent, with much of this increase occurring in the counties on the western shore of the Chesapeake Bay. Significant statewide trends include an increase in average lot sizes, contrary to anti-sprawl efforts to encourage cluster development and infilling, and a trend toward smaller households. This pattern of sprawl development and lack of adequate site design characterize much of the growth occurring in the western shore counties.

Impacts from this development pattern include fragmentation of contiguous forest areas and resultant loss in habitat and stream headwater protection; conversion of agricultural land to residential use; cumulative loss of small wetland acreage; depletion and degradation of groundwater supplies; delivery of excess nutrients streams; loss of opportunity to preserve meaningful green infrastructures connecting corridors and open spaces of ecological, economic, and recreational value; and loss of community identity and values.

State Activities 1992 to 1996

Regulatory controls: The Economic Growth Resource Protection and Planning Act, passed in 1992, calls for local governments and the state to improve growth management and sensitive area protection, and to address community economic well-being. Local governments must revise their comprehensive plans and implement related ordinances to comply with the act. The Maryland coastal program has funded the development or update of sensitive area elements of comprehensive plans and associated work such as sensitive area inventories, modeling of growth scenarios, Geographic Information System mapping of sensitive lands, and development of plan elements. The act also established state policy and an interdepartmental procedure for reviewing state projects for consistency with that policy. **(Section 309)**

Technical assistance (planning guidelines): The Maryland Office of Planning initiated a **Models and Guidelines** publications series, under which over twelve documents have been prepared and distributed on topics such as sensitive areas protection, regulatory streamlining, cluster development, transferrable development rights, and urban growth boundaries. Workshops on related topics have also been held.

Governmental reorganization: The Department of Natural Resources was realigned in 1995 to better direct its activities and resources toward identified outcomes and strategies. The Growth and Resource Conservation Division was created to oversee and coordinate the department's growth management efforts.

Regulatory controls: A statewide Smart Growth Initiative initiated by the governor includes a package of five bills introduced in the legislature.

Planning (National Estuary Program): Maryland's Atlantic Coastal Bays Watershed was designated as part of the National Estuary Program in 1995, and a Comprehensive Conservation and Management Plan is being developed to improve water and habitat quality, restore and create habitat, and achieve other goals.

Planning (watershed management): Development of Tributary Strategies to achieve nutrient reduction targets in the Chesapeake Bay has enhanced Maryland's ability to address cumulative and secondary impacts. Developing the strategies involved characterizing the watersheds, analyzing manage-

ment options, developing a comprehensive strategy, and creating tributary teams to assist with implementation. **(Section 309)**

Regulatory controls: The Riparian Forest Buffer Initiative, signed in 1996, will also enhance the state's ability to address cumulative and secondary impacts. The goal of the initiative is to protect forest buffers where they currently exist and to reestablish them where they have been degraded.

Governmental coordination: The Department of Natural Resources has also initiated an effort to recognize the importance of ecosystem management at different levels through the preparation of a plan to better integrate the resource management activities within its authority.

Obstacles/Needs

Need for technical/financial assistance to locals: Because the Economic Growth, Resource Protection and Planning Act offers considerable flexibility to local governments, there is a need to continue offering incentives and direct assistance in preparing sensitive area plan elements, and a need to assure proper development of sensitive areas protection ordinances and effective implementation of such ordinances.

Need for redirection of resources/funds for acquisition: The Smart Growth initiative has identified the need to infill and improve urban areas by aggregating and redirecting state resources to qualifying neighborhoods for conservation or restoration purposes; the need to contain sprawl by working with local jurisdictions to identify priority service areas; the need to secure rapid protection of large contiguous areas and open space and green networks before development patterns lead to fragmentation and land and easement prices rise beyond the point of public affordability.

Data needs: An objective of the Maryland Coastal Bays Program is to promote ecologically sound, sustainable development, but building a consensus on what that goal entails would be facilitated by data on factors such as the total cost of development, the value of tourism, and the value of the region's resources.

Summary of Strategy

Technical assistance: Outreach and technical assistance will be linked to the Economic Growth, Resource Protection, and Planning Act and will include direct technical assistance to local governments in drafting comprehensive plan sensitive area elements and implementing ordinances; planning and conducting workshops for local planners; and monitoring and management of grants to local governments.

Technical assistance (grants to local governments): Funding will be passed through to local jurisdictions to assist in completing their sensitive area elements and implementing ordinances.

***Nonregulatory controls (incentive programs)*:** Section 309 funds will be used to help develop and promote an array of incentives to maintain and restore forest buffers. Incentives may take the form of technical assistance, financial assistance, tax abatement, and regulatory relief. Changes in statutes, regulations, policy directions, and operations orders will be needed to enhance or establish successful incentive programs.

Contact:
Gwynne Schultz, Program Manager
Coastal Zone Management Division
Dept. of Natural Resources
Tawes State Office Building E-2
580 Taylor Avenue
Annapolis, MD 21401
Phone: 410-260-8730
FAX: 207-287- 8059
E-mail: gschultz@dnr.state.md.us

Massachusetts

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

The top forty growth communities in Massachusetts are located within the coastal watershed area, with an average coastal growth rate of 12.6 percent from 1980 to 1990. While large, urbanized areas have been essentially stagnant, communities in the more rural, less densely populated areas exhibited growth rates greatly exceeding the statewide average. Consistent with that trend, interpretation of aerial photographs indicated that between 1971 and 1985 forested land was lost to residential and commercial land uses in every watershed across the state.

State Activities 1992 to 1996

Assessment (impact assessment): As part of its Coastal Nonpoint Program development, the Massachusetts Coastal Zone Management Program (MCZM) developed an approach for identifying critical coastal areas, with the goal of determining areas where new or substantially expanding land uses may contribute to current or future impairment of water quality. Threshold criteria for screening and evaluating there areas were developed, and MCZM has been working to compile and synthesize information as it becomes available for the development of environmental sensitivity indexes and resource characterization in these areas.

Governmental coordination; Planning (watershed management): The Executive Office of Environmental Affairs' Watershed Initiative has created a water resource decisionmaking framework. Basin teams with team leaders and representatives from several state agencies have been established for the 27 major watersheds to assess and evaluate water quality within each basin. MCZM and the Department of Environmental Protect are contributing to the assessment, monitoring, and outreach efforts for each of the coastal basins and wetlands. **(Section 309)**

Assessment: The Waquoit Bay National Estuarine Research Reserve is conducting research to examine cumulative impacts of activities on coastal habitats.

Planning (National Estuary Program): Massachusetts Bays and Buzzards Bay National Estuary Program strategies are being implemented.

Regulatory controls (jurisdiction): The Massachusetts Coastal Program boundary was expanded for the purposes of the Coastal Nonpoint Program, providing acknowledgment of the need to recognize watersheds as the operative unit for planning and evaluation purposes.

Regulatory controls (performance and design standards): A stormwater advisory committee assisted MCZM and DEP to develop a stormwater policy with performance standards and design criteria for stormwater controls, which have been implemented since November 1996.

Obstacles/Needs

Inadequate data: Data gaps continue to exist.

Inadequate analytical methods: Analytical methods are still problematic in some instances.

Public education: Public acceptance and local implementation are still not sufficient, but the coastal nonpoint plan provides a blueprint for ongoing future efforts.

Summary of Strategy

The priorities of the Massachusetts strategy for improving management of cumulative and secondary impacts are to develop and implement programs and standards to improve abatement of nonpoint pollution, to develop and implement a coastal monitoring plan, and to develop better abilities to track land use changes and manage water quality data.

Contact:
Bruce Carlisle
Coastal Management Program
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, MA 02202
Phone: 617-727-9530 ext. 298
Fax: 617-727-2754
E-mail: bcarlisle@state.ma.us

New Hampshire

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

A number of areas in the New Hampshire coastal zone are experiencing rapid growth of residential, commercial, and/or industrial land uses, causing habitat destruction, habitat fragmentation, increased runoff, threats from septic systems, and human disturbance (e.g., to sand dune ecosystems). The coast is New Hampshire's fastest growing region.

State Activities 1992 to 1996

Assessment (impact assessment): New Hampshire carried out a project to assess bacterial and nutrient contamination of tidal waters by subsurface disposal systems. The project involved determining the condition of existing subsurface disposal systems, assessing the level of bacterial and nutrient contamination from these systems, and drafting and passing legislation (see below). Other impact assessment projects involved assessing current septic system design criteria on coastal habitats and water quality, and assessing the effectiveness of permanent stormwater control measures. **(Section 309)**

Regulatory controls: The state expanded the regulatory definition of developed waterfront property to include land contiguous to or within 200 feet of tidal waters that uses a septic system. At the time of sale of such property, the condition of these septic systems must be determined through a Tidal Water Site Assessment. **(Section 309)**

Planning (dredging): The Port Authority was charged with developing a long-range plan and schedule to guide individual dredging activities.

Planning (watershed management): The coastal program has initiated a watershed approach to addressing nonpoint sources. The coastal program, together with local planning commission and watershed committees, work to identify nonpoint source problems and review land use controls. In another watershed where a similar process was used, computer models were also employed to identify water quality impacts of various development scenarios. A video on erosion and sediment control was produced. **(Section 309)**

Planning (National Estuary Program): In 1995, New Hampshire Estuaries were designated as part of the National Estuary Program (NEP). The management plan for this NEP will focus on water quality and shellfish resource issues. Nonpoint source pollution abatement and prevention is a major thrust of this work. The New Hampshire Coastal Program staff assisted NEP with shoreline surveys and water quality testing. This identified pollution sources and led to the opening of clam flats for harvest.

Obstacles/Needs

Funding; enforcement; political will: There is a need in the state for resources, education, and motivation to enforce local regulations that require stormwater and erosion/sediment controls. Development projects below the minimum size threshold for state review are reviewed only under local regulations. These regulations vary from place to place in content and the extent to which they are enforced. Developing and funding a circuit rider position for the coastal region would help resolve this situation.

Public education: The coastal program needs to assist in disseminating information about septic system operation and maintenance, and the water quality impacts of malfunctioning systems, to all coastal homeowners.

Summary of Strategy

The New Hampshire strategy for addressing cumulative and secondary impacts focuses on water quality issues, especially nonpoint source pollution. Specific tasks are oriented toward key nonpoint source issues, such as bacteria levels in stormwater control structures and training on stormwater control measures, and include the following:

Assessment (impact assessment): A study was undertaken to determine whether stormwater control structures are acting as bacteria generators; results of the study were used in reevaluation of stormwater control rules and changed as necessary to reflect the results of the study.

Technical assistance (public education): A prioritized list of needed educational resources was developed. A video was also developed related to stormwater management and erosion and sediment control. This video incorporates information on newly adopted BMPs for stormwater control structures.

Assessment (impact assessment); information management: To fully implement newly enacted regulations regarding septic system site assessment, a Tidal Water Site Assessment Form was developed. In addition, a system was developed to manage and analyze the data gathered on these forms.
A workshop will be held in the Spring of 1999 on impervious surface impacts on water quality and how to control sprawl.

Contact:
Ted Diers
Office of State Planning
2 1/2 Beacon Street
Concord, NH 03301
Phone: 603.271.1775
Fax: 603.271.1728
E-mail: tdiers@osp.state.nh.us

New Jersey

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

New Jersey's entire coastal area is developing at a rapid rate. Much of the development is residential growth, with redevelopment also occurring in more urbanized areas. The most rapid growth has been in the northern and central portions of Ocean County, along the New York metropolitan corridor, where population has grown more than 20 percent in the past decade. The primary cause of degradation of sensitive areas such as shallow bays, tidal riverine systems, and tributaries is nonpoint source pollution. Conversion of land use from agriculture or forest to suburban residential has also had many impacts of both an aesthetic and environmental nature.

State Activities 1992 to 1996

Planning (National Estuary Program): The Barnegat Bay National Estuary Program Comprehensive Coastal Management Plan has involved efforts to coordinate county, local, and federal level management of resources within the watershed.

Governmental coordination: The passage of the State Development and Redevelopment Plan (SDRP) involved cross acceptance by county and municipal governments of policies to guide future development. At the state level, agencies are working to coordinate the efforts of the SDRP into their functional plans and regulatory responsibilities.

Planning (watershed management): The Department of Environmental Protection is developing a Statewide Watershed Management Framework, which will provide for application of regulations, policies, and standards on a watershed basis, rather than statewide. **(Section 306/309)**

Information management (database development): An effort has been ongoing to develop greater coordination in development of data layers and to bring data needs to greater awareness, although lack of data is still an issue coastwide. Grant funds have also been used to provide coastal communities with resources to develop digital data sets of community resources. **(Section 309)**

Obstacles/Needs

Boundary: The location of the existing coastal zone boundary makes it difficult to address impacts within a watershed but outside the regulatory boundary.

Governmental coordination: There is a need to develop mechanisms to involve all levels of government in the assessment and decisionmaking framework of coastal management.

Data: Quantitative and trend data on coastal resources is lacking, as is data that can be used to differentiate the cumulative and secondary impacts of development, and data to track the effectiveness of regulatory controls.

Summary of Strategy

New Jersey's strategy is to develop a sustainable watershed management framework in an attempt to balance human use of land and water systems to ensure the community is living within the carrying capacity of the natural system. The state has identified individual watershed management areas in which management strategies will be developed.

Contact:
Dorina Frizzera
Office of Environmental Protection
401 East State Street, 6th Floor
P.O. Box 418
Trenton, NJ 08625-0423
Phone: 609-777-3251
FAX: 609-292-4108
E-mail: dfrizzera@dep.state.nj.us

New York

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

New York's coastline, which includes open ocean coast on the Atlantic, the semi-enclosed Long Island Sound, and extensive shoreline along Lakes Erie and Ontario, is home to more than 70 percent of the state's population. Demands for commercial, industrial, and residential land uses are heavy, with demand for recreational use also high, and increasing. These often competing demands pose significant issues for the future management of New York's varied coastal resources. In particular, impacts are seen in the extent of waters closed to shellfishing and declining populations of shorebirds such as terns and plovers. Decline in a globally rare species of amaranth illustrates the impact of habitat losses on plants. Increased pressure on limited public access points is another indicator of cumulative and secondary impacts of coastal development.

State Activities 1992 to 1996

Regulatory controls: Amendments to the State Environmental Quality Review regulations were made in January 1996 to give full consideration to environmental factors, including cumulative and secondary impacts, during early planning stages of direct actions funded or approved by local, regional, and state agencies.

Regulatory controls (legal authority): Several improvements have been made to enable municipalities to address cumulative and secondary impacts more effectively through their Local Waterfront Revitalization Programs (LWRPs). These include giving municipalities the authority to implement Harbor Management Plans (HMPs) within their jurisdiction. HMPs, which are integrated with LWRPs, address impacts, including cumulative and secondary impacts, to particular water bodies. Since July 1992, eleven new LWRPs have been approved by OCRM, and two previously approved plans have been amended to better address cumulative and secondary impacts. HMPs have been developed or are in the process of being developed in at least eight communities. **(Section 306/309)**

Planning (watershed management): Plans for two small watersheds, both important embayments on the north shore of Long Island, are being developed.

Planning (special area management planning): A comprehensive Regional Coastal Management Program was developed to address cumulative and secondary impacts to the Long Island Sound region. As part of this process, smaller subregions were identified, and plans covering these smaller geographic areas were developed or are being developed. The state is also in the process of developing similar plans for New York City and the state-designated South Shore Estuary Reserve. **(Section 306/309)**

Obstacles/Needs

Not addressed in assessment.

Summary of Strategy

New York plans to continue to address cumulative impact issues through the use of existing programs such as the State Environmental Quality Review Act and implementation of special area management plans, as well as through development of additional special area management plans. Specific goals include:

Regulatory controls: The New York Coastal Management Program originally designated state parks, local waterfront revitalization areas, and estuarine sanctuaries as special management areas requiring development of detailed management plans. The coastal program proposes to expand the definition of special management areas to include areas or regions with distinctive and cohesive natural, recreational, industrial, commercial, ecological, scenic, or historic resources; areas with urban characteristics where shoreline and water uses compete or where concentrated uses are appropriate; and areas or regions that are subject to issues requiring attention beyond that provided for in the statewide coastal management program.

Planning (special area planning): Several communities on Long Island and in other areas of the state have expressed interest in working with state agencies to develop Maritime Center Plans. These plans will help stabilize and, in some instances, encourage those aspects of coastal resource use for which the areas are especially suited. The state also plans to initiate planning for additional Outstanding Natural Coastal Areas on Long Island and in other parts of the state. Cumulative and secondary impacts will also be addressed through brownfields rehabilitation plans.

Contact:
Charles McCaffrey
Division of Coastal Resources and Waterfront Revitalization
Department of State
41 State Street
Albany, NY 12231
Phone: 518.473.3368
Fax: 518.473.2464
E-mail: cmccaffrey@dos.state.ny.us

Rhode Island

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: Low

Issue Characterization

Most of Rhode Island's population is situated in the state's 21 coastal municipalities, especially those located within the Narragansett Bay watershed. Much of the new development taking place in the state is located within the coastal municipalities and is residential in nature. Increasingly, agricultural and forested lands are being converted for urban and suburban uses. Additional pollutant sources associated with infrastructure changes and Individual Sewage Disposal Systems (both existing and new) threaten water quality, sensitive areas and wildlife habitats.

State Activities 1992 to 1996

Planning (special area management planning): The Salt Pond and Narrow River Special Area Management Plans are currently being updated to reflect new water quality and land use data. A study on cumulative and secondary impacts for the two areas will provide new groundwater, nutrient loading, and buildout analysis data that will be the basis for any regulation and boundary revisions. It will also provide new Geographic Information System coverages within these watersheds. Recommendations for changes in zoning may be made as a result of the new data.

Planning (special area planning): Another program, the Narragansett Bay Project, involves the restoration of Greenwich Bay, which has been closed to shellfishing since December of 1992. The Rhode Island Department of Environmental Management and the local government, city council, and other groups are coordinating to identify and remediate the bay's various pollution sources.

Planning (comprehensive planning): The statewide Municipal Comprehensive Planning Program and associated enabling acts may be viewed as an integrated approach to state oversight over land use planning, including cumulative and secondary impacts. The act requires that local zoning ordinances be amended to consider allocation of land uses and of optimum intensities and standards based upon considerations that include natural land characteristics and impacts on surface and groundwater, wetlands, coastal features, and other sensitive and fragile natural resources.

Regulatory controls: An inspection program for septic systems is under development, and alternate treatment systems are being assessed for regulatory approval.

Regulatory controls: The Coastal Resource Management Council adopted new buffer zone requirements to mitigate the cumulative and secondary impact of development in coastal areas.

Obstacles/Needs

None

Summary of Strategy

None

Contact:
Jeff Willis
Coastal Resources Management Council
Oliver Stedman Government Center
4808 Tower Hill Road
Wakefield, RI 02879
Phone: 401-277-2476
FAX: 401-277-3922
E-mail: jeffwillis@riconnect.com

Virginia

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

Coastal counties and cities in Virginia are generally among the fastest growing areas in the state. From 1992 to 1996, coastal population increased by approximately 4.5 percent; in some coastal counties growth exceeded 15 percent. Land use changes also give an indication of the kinds of pressures to which resources are exposed: it is estimated that 16,000 acres of forest land are being converted to urban (13,600 acres) or agricultural use (2400 acres) in the Virginia coastal zone each year. Specific resource concerns include loss of bird migration corridors and stopover areas; loss of habitat for rare species and community types; loss of farmland serving as buffers; and increased nonpoint source runoff into the Chesapeake Bay, with loss of productivity of the Bay.

State Activities 1992 to 1996

Planning (regional planning): The original 309 Assessment contained a suggestion to broaden the role of regional entities such as Planning District Commissions (PDCs). Several initiatives to strengthen the role of PDCs were submitted to the 1997 General Assembly. Regional activities, such as the Sustainability Council in the Thomas Jefferson Planning District and regional nonprofits such as the Elizabeth River Project, have also increased significantly.

Planning (open space initiatives): Open space initiatives have also increased through a variety of organizations, such as the Virginia Outdoors Foundation, an independent state agency, and private groups such as The Nature Conservancy, Friends of Dragon Run, the Chesapeake Bay Foundation, and the Williamsburg Land Conservancy.

Regulatory controls: Several new pieces of legislation, state programs, and state-supported but locally initiated projects that deal with nonpoint source pollution, habitat protection and restoration, citizen education, and pollution prevention have emerged since 1992.

Agricultural Stewardship Act - established guidelines for agricultural nutrient management and a system for triggering investigations of violations.

Riparian Forest Buffer Strategies - established goals for the Chesapeake Bay Program, including restoring riparian forests on 2,010 miles of stream and shoreline in the watershed by the year 2010.

Tributary Strategies - Virginia is developing strategies to meet the Bay Act requirement of a 40 percent reduction in nutrient loads by 2000. A strategy for the Shenandoah and Potomac Tributary was completed in 1996. Strategies for the York and James are scheduled for completion in 1998.

Erosion and Sediment Control Program - the authority of local governments was expanded to include establishment of procedures to issue stop work orders on private projects.

Governmental reorganization: The Virginia Department of Environmental Quality was established in April 1993, bringing state expertise in air, waste, and water together in the same agency.

Planning (watershed planning): In 1992, under the terms of the Chesapeake Bay Program, Virginia began developing tributary strategies to meet the targets for reduction of nutrient loads to the bay (See Regulatory controls above).

Obstacles/Needs

Growth management: Controlling growth is primarily the realm of local government comprehensive planning, but local planning tends to steer development rather than control it in ways that reduce cumulative and secondary impacts on coastal resources.

Summary of Strategy

The Virginia strategy focuses on the development and implementation of two Special Area Management Plans: one for the Southern Watershed Area and one for Northampton County, on the Eastern Shore. Primary management issues in the southern watershed area are existing threats to water quality; habitat loss and other threats from new development; and water use, land use, and management conflicts. Specific goals of the SAMP include refining development controls to protect water quality and preserve critical habitat; improving the use of preservation districts; protecting habitat through conservation easements and other techniques; improving public access to natural resource areas; and improving agricultural Best Management Practices.

Contact:
Laura McKay
Chesapeake Bay & Coastal Program
Dept. of Environmental Quality
629 East Main St. - 6th Floor
Richmond, VA 23219
Phone: 804.762.4323
Fax: 804.762.4319
E-mail: lbmckay@deq.state.va.us

southern/ caribbean

Alabama

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: Low
1997 Assessment: High

Issue Characterization

Coastal counties in Alabama are experiencing rapid population growth, sprawl development, and conversion of agricultural land to residential development. This growth has resulted in cumulative and secondary impacts including nonpoint source pollution from on-site sewage disposal systems, run-off and sedimentation caused by increases in impervious surfaces, and increases in toxin and nutrient loadings to waterbodies.

State Activities 1992 to 1996

Technical assistance (BMP manuals): Numerous Best Management Practices manuals have been prepared and distributed to address nonpoint pollution.

Obstacles/Needs

Public understanding: There is a need for greater public education regarding causes and effects of cumulative and secondary impacts.

Summary of Strategy

Planning (watershed management): Alabama proposes to investigate watershed management options for addressing cumulative impacts. Because many activities occur beyond the 10-foot-contour boundary of the Alabama coastal zone but affect coastal resources nevertheless, it is necessary to ascertain opportunities or mechanisms for watershed management to address these impacts upon the coastal area. The possibilities of creating a formal watershed authority or of managing through networking of agencies and government entities under a Special Area Management Plan will be evaluated.

Technical assistance (outreach and education): Coastal Programs is working with area watershed groups to develop a training program on Best Management Practices for dirt movers, as well as a citizen component to identify authority and steps for action. Many citizens can spot violations but they do not know what the regulations state, or who to call. This lack of knowledge leads to confusion with local enforcement officers. As the education grows, we expect citizens to become more informed and actions to change. This project will serve as a pilot project and will gradually be adapted for other regions of the state.

Coordination; information management: Alabama proposes to develop and implement a strategy to coordinate existing monitoring programs for water quality, wetlands and habitat, and other parameters, and to identify information needs and gaps and a strategy for information sharing.

Contact:
Philip Hinesley
Alabama Dept. of Econ. & Comm. Affairs
P.O. Box 5690
401 Adams Avenue
Montgomery, Alabama 36203-5690
Phone: 334.242.5502
Fax: 334.242.0552
E-mail: phinseley@surf.nos.noaa.gov

Florida

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

Population density continues to increase in Florida, primarily along the coast, and cumulative and secondary effects on quality and amount of wetlands, water quality, water quantity, amount and quality of wildlife habitat, and all other environmental factors continue to be observed. Water supply has become a prominent issue in the last five years, and shortages are becoming more frequent as demands on the state's aquifers exceed their ability to recharge. There have been heated conflicts between metropolitan areas and less-developed counties, resulting in bitter discussions of interbasin and interdistrict water transfers to meet the needs of the human population.

State Activities 1992 to 1996

Planning (comprehensive planning): A Florida statute requiring local governments to include consideration of cumulative and secondary impacts in coastal management elements of local comprehensive plans was incorporated into the state's federally approved coastal management program.

Assessment (impact assessment); regulatory controls: Studies of cumulative impacts of septic tanks on water quality in the Florida Keys prompted programmatic changes concerning the Florida Department of Health and Rehabilitative Services jurisdiction over septic tank permitting. The agency is now allowed to base permitting decisions on water quality impacts as well as on human health considerations. Additional studies are underway to test alternative advanced wastewater treatment systems in the Florida Keys. **(Section 309)**

Planning (special area planning): The state has been divided into twenty-four ecosystem management areas, most of which either have coastal attributes or include river systems that eventually feed into coastal waters. Within each management area, the Department of Environmental Protection has allowed latitude in how staff implement ecosystem management.

Regulatory controls: State water policy and the Florida water plan have been changed to address water supply, flood protection, floodplain management, water quality, and natural systems. Water management districts are required to establish minimum flows and levels for surface waters, spring flows, and aquifers.

Assessment (policy recommendations): The Sustainable South Florida Commission, created by the governor, was charged with assuring a healthy Everglades ecosystem and with developing recommendations to halt and/or reverse cumulative and secondary impacts of development on South Florida environmental resources. Principal recommendations have focused on supporting programs designed to restore components of the South Florida Ecosystem and initiatives to promote environmentally sound development, infill, and redevelopment of the southeast Florida urban core.

Information management (baseline data): Two sets of environmental indicators have been developed, one addressing statewide issues, the other coastal issues. Both are an attempt to compile baseline data in a single document so that future cumulative impacts can be measured against them. The project has also pointed out shortcomings of existing data.

Information management (indicators): The Department of Environmental Protection (DEP), as part of its Ecosystem Management Initiative, is also seeking to establish ecosystem indicators for the designated ecosystem management areas in Florida. The DEP and water management districts are also preparing a set of common water management performance indicators.

Obstacles/Needs

Baseline data: Baseline data against which future cumulative and secondary impacts can be compared are lacking for many parameters. The subtlety of the causes of impacts is problematic in attempts to document impacts.

Public perception: It is difficult to convince the general public and policy makers that each small incremental development contributes to overall significant impacts.

Summary of Strategy

None included with Assessment

Contact:
Chris McCay
Florida Coastal Management Program
Department of Community Affairs
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100
Phone: 850-414-6562
FAX: 850-487- 2899
E-mail: chris.mccay@dca.state.fl.us

Louisiana

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: Moderate

Issue Characterization

General population growth characterizes the Louisiana coastal zone, the result of an improving oil and gas economy and diversification of other economic sectors. Growth is especially rapid along the north shore of Lake Pontchartrain and along the natural levees and bottomland hardwoods of the river region. Impacts due to growth are primarily associated with the extreme southeastern portion of the Louisiana coastal zone; cumulative and secondary impacts in the rest of the coastal zone are associated primarily with navigation and mineral extraction activities. Canals and open water channels constructed for such activities have produced significant cumulative and secondary impacts through erosion and introduction of saltwater into freshwater areas. Impacts of growth are evident in increased runoff; sewage releases; solid waste problems; and pollution from lawn and garden products. Further, the increase in population resulting from such growth may overwhelm public recreational facilities, such as boat ramps and fishing places, in the coastal area.

State Activities 1992 to 1996

Information management (data analysis): The Louisiana Geological Survey of the Department of Natural Resources developed a report on data gaps for addressing cumulative and secondary impacts. **(Section 309)**

Assessment (regulatory analysis and recommendations): The Coastal Management Division (CMD) is combining information from the survey of data gaps with the newly developed coastal nonpoint program to support modifications to rules and procedures for permitting.

Assessment (assessment methodology): The CMD is also developing a standard protocol for measuring impacts of activities required by CMD. The project involves review of databases, developing protocol for new data and correction of past data. Resulting changes will occur in the administrative policies of the Louisiana Coastal Resources Program. Revised procedures will ensure that new habitat impact data are consistent for all regulatory functions. **(Section 309)**

Assessment (impact analysis): The indirect impacts of pipelines on coastal systems are being analyzed. Because most of the coastal zone is wetlands, habitat recovery is more complex than on upland sites. In marshes, excavated material usually shrinks after excavation, and a depression often forms and becomes a conduit for tidal exchange. Deeper trenches may convert to open water rather than return to vegetated wetlands. CMD has not had a database on factors such as soil type, vegetation, hydrology, and elevation that could be used to direct pipeline installation or to predict rates of habitat recovery, although indirect impacts could be reduced by creating such databases for use by permit analysts. **(Section 309)**

Obstacles/Needs

None

Summary of Strategy

CMD has determined that the cumulative and secondary impacts projects approved under the original assessment process, combined with development of the coastal nonpoint program, should be adequate to address CSI problems.

Contact:
Greg DuCote
Coastal Management Division
Dept. of Natural Resources
P.O. Box 44487
625 North Fourth Street
Baton Rouge, LA 70802
Phone: 225-342-7591
Fax: 225-342-9439
E-mail: gregd@dnr.state.la.us

Mississippi

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

Coastal population growth rates have been high in Mississippi, with increases ranging from 11 to almost 15 percent throughout the coastal counties from 1990 to1994. The introduction of casino gambling in 1992 spurred much of this growth. Residential, commercial, and industrial development is centered along the coastal areas of three counties, and moving inland. Sizeable areas of wetlands are also delineated in the southern portions of these counties. Predominant land uses in the remaining portions of those counties are public lands, open space, and prime farmland.

State Activities 1992 to 1996

Regulatory controls: A new on-site wastewater disposal law includes provisions requiring the State Board of Health to adopt rules governing design, construction, installation, and operation and maintenance of onsite disposal systems for single family residences. The law also provides the Board of Health with the authority to inspect systems, require repair, and apply penalties in certain instances. It also gives local governments the authority to adopt similar or more restrictive ordinances governing systems. **(Section 309)**

Technical assistance (Best Management Practices guidelines): Comprehensive marina siting and development guidelines have been prepared, incorporating state of the art standards to address nonpoint source pollution. **(Section 309)**

Obstacles/Needs

Legal authority: Clear authority within the coastal program to address cumulative and secondary impacts is lacking because many of these impacts are attributable to land use activities outside the jurisdiction of the coastal program. The challenge is to devise partnerships with jurisdictions and agencies that do have regulatory authority over land use activities. One way to address these issues is through the Comprehensive Resource Management Plan being developed for the coastal counties.

Analytical methods: Adequate analytical methods for managing cumulative and secondary impacts are lacking. It is believed that the technology exists to perform computerized modeling to illustrate cause and effect relationships of proposed development or zoning scenarios in coastal watersheds. Such modeling can also serve as a visual aid for educating officials and the public.

Data Needs: The lack of consistent water quality monitoring information is a significant gap.

Summary of Strategy

Mississippi proposes four projects to address cumulative and secondary impacts:

Regulatory controls (comprehensive resource management plan): The state proposes to develop and implement a comprehensive urban nonpoint source management program that will include model ordinances for stormwater management, floodplain management, and erosion control.

Technical assistance (siting and development guidelines): The state will develop marina siting and development guidelines.

Planning; nonregulatory controls; technical assistance: The state, together with other stakeholders, will undertake a Rural Wastewater Initiative to develop policies, plans and resources, and design recommendations that will enable local governments to expand the delivery of wastewater treatment capacity to the rural areas of coastal counties not currently serviced, regulated, or managed by an existing private or public wastewater organization.

Planning: The Hancock County Wastewater District #1 Planning and Design Assistance project will develop a facilities plan for each wastewater collection system to be constructed within the district.

Contact:
Steve Oivanki
Mississippi Department of Marine Resources
1141 Bayview Avenue, Suite 101
Biloxi, MS 39530
Phone: 228.374.5000
Fax: 228.374.5008
E-mail: soivanki@datasync.com

North Carolina

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

Census data and permit files from the North Carolina Coastal Management Program indicate a significant increase in residential development along estuarine and riverine shorelines. This development includes conversion of forest land to residential development and projects such as large marina/golf course developments. One result of such land use changes has been lowering of the Black Creek aquifer in the central coastal areas. Increases in animal operations in the Piedmont and coastal areas have also resulted in threats to groundwater and riverine/estuarine water quality. North Carolina also continues to lose wetlands in the coastal area, most significantly, nontidal, freshwater wetlands.

State Activities 1992 to 1996

Information management (database development): North Carolina has established the Population, Development, Resource Information System (PDRIS), a comprehensive database of information related to population growth, economic development, and natural resources in the North Carolina coastal area. The information is organized on a small watershed basis for use in identifying areas at high risk of adverse cumulative impacts. **(Section 309)**

Coordination; Planning (watershed management): The North Carolina Division of Water Quality is implementing a basinwide approach to managing water quality, intended to improve efficiency, effectiveness, and consistency of the state's surface water quality protection program. Under this approach, all water quality programs including permitting, monitoring, modeling, nonpoint source assessments, and planning are coordinated and integrated by river basin. **(Section 309)**

Technical assistance (local government assistance): The North Carolina Division of Coastal Management compiles customized information packages to local governments for use in land use planning. Information is gathered from state and federal agencies and organized to correspond with the state land use planning guidelines. **(Section 309)**

Regulatory controls (local government requirements): Local land use planning guidelines have been revised to require local governments to assess present land and water uses on a watershed basis and to consider watersheds in developing local policies for growth. **(Section 309)**

Regulatory controls: In 1996 the General Assembly enacted new legislation mandating the development of a general permitting program and monitoring requirements for animal operations.

Obstacles/Needs

Methodology: An approach to cumulative and secondary impacts designed to minimize impacts of individual projects on important coastal resources is not adequate where high concentrations of development have occurred or will occur.

Legal authority: The Coastal Resources Commission has yet to exercise its authority to deny permits for development on the basis of cumulative effects. The Division of Coastal Management continues to develop rules for consideration and minimization of cumulative impacts in high risk areas or areas of sensitive resources.

Data and analysis needs: Gaps in data and analytical methods include resource impacts from Coastal Area Management Act (CAMA) permits and other permits; geolocation of permitted projects; identification of cumulative impact high risk areas; and methods for assessing and predicting cumulative impacts.

Summary of Strategy

Assessment (impact assessment); information management: North Carolina proposes to develop guidelines for consideration of cumulative impacts in CAMA permit decisions for as many Area of Environmental Concern (AEC) categories as feasible. Accomplishing this project will include redesigning the CAMA permit tracking system and integrating it with the Division of Coastal Management GIS; analyzing specific permit activities and their impact on resource areas; and developing guidelines for assessing cumulative and secondary impacts.

Contact:
Pat Hughes
Division of Coastal Management
NC Dept. of Environment and Natural resources
P.O. Box 27687
Raleigh, NC 2711-7687
Phone: 919-733-2293
FAX: 919-733-1495
E-mail: pat_hughes@mail.enr.state.nc.us

Puerto Rico

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

Although the planning board of Puerto Rico has had the authority since 1974 to conduct assessments of cumulative and secondary impacts on economic and social situations, none of the agencies involved in review of development proposals has ever analyzed cumulative and secondary impacts on coastal resources as a regular component of project review. This lack of adequate review of cumulative and secondary impacts has led to resource problems after development occurs.

State Activities 1992 to 1996

Assessment (impact analysis); Information management: The Puerto Rico coastal program developed a procedure for cumulative and secondary impact analysis based on the use of Geographic Information Systems. The process was tested using data for the Island of Culebra, and agreement was reached among all the agencies involved to adopt the process after adequate testing and development of a user manual. **(Section 309)**

Obstacles/Needs

Inadequate baseline data: The commonwealth lacks a systematic compilation of baseline data for coastal and aquatic resources, and systems for compiling information are antiquated.

Lack of interest by management: Several commonwealth agencies have not demonstrated much interest in developing capabilities for cumulative and secondary impact review.

Information exchange: Although numerous states and territories are developing procedures for addressing cumulative and secondary impacts, opportunities to exchange information on the topic are lacking.

Summary of Strategy

Assessment (impact assessment); Information management: Puerto Rico plans to expand its GIS system for cumulative and secondary impact assessment to additional areas of the island. Permit review will then be based on a common analytical approach adopted by all relevant agencies. Priority for initial implementation will be watersheds in special planning areas. A common database will be available to agencies involved in permitting.

Contact:
Demaris Delgado
Bureau of Reserves, Refuges and Coastal Resources
Department of Natural and Environmental Resources
Pda. 32 Ave Munoz Rivera
P.O. Box 9066600
San Juan, PR 00906-6600
Phone: 787-725-1155
FAX: 787-721- 7591
E-mail: prczmp@caribe.net

South Carolina

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

Increasing population and urban expansion lead to development in previously pristine areas. The heavy development of beachfront resort areas and golf courses leads to needs for new infrastructures. The proximity of ports and the availability of abundant land, along with an industry friendly attitude, is leading to an increased industrialization of the coastal zone. The construction of new port facilities, especially in the Charleston area, alters existing land uses and leads to the increased need for dredging and spoil disposal.

State Activities 1992 to 1996

Regulatory controls: Marina regulations have been revised to prohibit new marinas in waters open to shellfish harvesting and to require comprehensive water quality monitoring and other restrictions at other sites. **(Section 309)**

Regulatory controls: Regulations for private docks have been changed to require minimum lot widths for dock eligibility, to restrict dock sizes based on creek width, and to prohibit docks from bridging smaller creeks to reach larger water bodies. Regulations now also require dock master plans. **(Section 309)**

Information management: A Geographic Information System containing information on archaeological and historic resources, master plans, past permits, and other actions on a particular site has been incorporated into permit review, allowing the South Carolina Coastal Program to highlight sensitive areas in the coastal zone and to review past actions on particular sites.

Regulatory controls: Stormwater regulations have been revised and special coastal best management practices implemented. **(Section 309)**

Technical assistance: Assistance in septic tank design in or near sensitive coastal waters has been developed.

Obstacles/Needs

Information needs: The most significant need is for an adequate information base and geographical understanding on which to base decisions. Evaluating activities on a case-by-case basis is not an adequate management method for dealing with cumulative and secondary impacts. A big picture type analysis, coupled with early review and an expanded understanding of direct and indirect, long-term and short-term, impacts of activities will be required to protect coastal resources adequately. Such an understanding can be accomplished through a better basic understanding of resource capacities and limitations, coupled with the ability to examine potential impacts through a coordinated, comprehensive process.

Summary of Strategy

Assessment (impact assessment): The major piece of the South Carolina strategy is the development of a comprehensive coastal management plan to measure, assess, and manage cumulative and secondary impacts, taking into consideration local community values and outlook. The plan will emphasize the interface between upland development and adjacent estuarine areas, with a focus on small tidal creeks. An objective of the project is to determine if there is a quantifiable level where impacts accumulate to a detectable adverse limit.

Assessment (feasibility assessment); regulatory controls; technical assistance (public education): Another element of the strategy is to conduct a feasibility assessment for developing and implementing a septic system maintenance program for local communities; to develop and adopt site evaluation and design standards for large-scale and cluster onsite systems in the coastal zone; and, to develop a series of informational workshops for contractors and developers.

Contact:
Chris Brooks
Office of Ocean and Coastal Resource Management
South Carolina Dept. of Health and Environmental Control
2600 Bull Street
Columbia, SC 29201
Phone: 803.744.5838
Fax: 803.744.5487
E-mail: brookscl@chastn86.dhec.state.sc.us

U.S. Virgin Islands

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

Rapidly developing commercial and residential areas in the U.S. Virgin Islands have led to problems with sedimentation, water quality, and infrastructure. New development is especially problematic since most new development is taking place on steep slopes. Coral reefs, salt ponds, mangrove stands, and seagrass beds are among the islands' resources that are especially sensitive to such impacts.

State Activities 1992 to 1996

Regulatory controls: Rules and regulations have been established to provide guidance for activities that lead to cumulative and secondary impacts. The Environmental Protection Program rules and regulations have been revised to upgrade tier II requirements to the equivalent of those presently required by the territory's coastal zone management act.

Regulatory controls (permitting procedures): New coastal zone permit applications that focus on preventing non-point source pollution were developed under the nonpoint source control program.

Obstacles/Needs

Enforcement: Need better enforcement of existing policies.

Summary of Strategy

Planning (watershed management): To address cumulative and secondary impacts, the Virgin Islands Coastal Program will develop and implement a watershed management plan that will address urban runoff control practices and pollutant reduction strategies and techniques. The plan will protect the integrity of natural drainage systems and waterbodies to the extent feasible. Techniques such as establishing buffers along surface waterbodies and their tributaries will minimize conversion of areas that are particularly susceptible to erosion and sediment loss.

Contact:
Paul Thomas
CZM Program Manager
Department of Natural Resources
Office of Commissioner
Foster Plaza
396-1 Anna's Retreat
St. Thomas, VI 00802
Phone: 340-774-3320
FAX: 340-775-5706
E-mail: pthomas@surf.nos.noaa.gov

pacific

Alaska

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

Cumulative impacts of concern in Alaska include degradation of water quality and air quality, and loss or degradation of wetlands and fish and wildlife habitats. Activities perceived to cause these impacts vary depending on predominant regional land uses and activities but include community development, recreational activity, recreational or commercial development, industrial activities, and resource harvest and extraction activities.

Overall, consideration and management of cumulative and secondary impacts is still in its infancy in Alaska. The most commonly used methods for evaluating CSI include best professional judgment, internal discussion, local coastal management planning, and permit review techniques. While the Alaska Coastal Management Program (ACMP) does have adequate legal authority to consider cumulative and secondary impacts during project review and during local coastal district planning, there is no agreed upon methodology to do so. Some enhancement grant projects in specific regions of the state have developed successful assessment methodologies and control mechanisms for cumulative impacts to habitat.

State Activities 1992 to 1996

Assessment (policy analysis): Since 1992, Alaska has completed a number of reviews that synthesize and analyze methods for assessing and managing cumulative and secondary impacts. These include the following:

A comprehensive overview of how the Alaska Coastal Management Program and other Alaska state agencies address cumulative and secondary impacts **(Section 309)**;

Surveys and interviews with other coastal states and federal agencies to determine how they manage cumulative and secondary impacts **(Section 309)**;

A survey of Alaska coastal districts, agencies, and others to identify sites or areas affected by cumulative impacts, resources affected, and causes of the impacts **(Section 309)**;

A survey of methodologies for assessing cumulative impacts, considering cumulative and secondary impacts, and implementing decisions **(Section 309)**;

An evaluation of large project permitting **(Section 309)**; and

An evaluation of the usefulness of Geographic Information Systems (GIS) for determining impacts **(Section 309)**.

Assessment (impact assessment); nonregulatory controls:

(1) The Kenai River Study, led by the Alaska Department of Fish and Game, was designed to assess and control cumulative impacts along the Kenai River. The project included the following components:

Development and implementation of a cumulative impact assessment methodology using GIS to evaluate the cumulative impacts of shoreline development on juvenile king salmon habitat **(Section 309)**;

A summary of nonregulatory mechanisms that could possibly be used to control these impacts **(Section 309)**;

Analysis of the socioeconomic value of Kenai River salmon fisheries to the local economy **(Section 309)**;

Evaluation of the effects of instream structures on fish habitat **(Section 309)**; and

Recommendations for a continued approach to assessing and managing cumulative impacts of development on fish habitat **(Section 309)**.

(2) A similar project is underway in the Matanuska - Susitna Borough to evaluate cumulative impacts to riparian habitat in Cottonwood Creek, and develop measures to control these impacts.

Obstacles/Needs

Research needs: Knowledge about complex ecological relationships and carrying capacities of various resources is inadequate.

Assessment methods: Accurate and standardized assessment methods and predictive models for cumulative impacts are lacking.

Permitting criteria: Adequate criteria for permit decisions are needed.

Funding: Funding is needed for monitoring, enforcement, and training. Further, the cost of obtaining legally and scientifically defensible data is high.

Management commitment: Upper management commitment to addressing the issue of cumulative and secondary impacts is needed.

Summary of Strategy

The ACMP intends to use section 309 funding to build upon or complement other efforts currently underway related to cumulative and secondary impacts. These efforts will include projects in the following categories:

Assessment (regulatory analysis): Examine how the regulatory process for a specific type of project addresses cumulative and secondary impacts, and pursue revisions as appropriate.

Assessment (impact analysis): Expand upon current cumulative impact analyses of timber harvest and strengthen district effectiveness in ACMP consistency review of timber harvest activities.

Assessment (impact assessment); nonregulatory controls: Continue and expand the Kenai River project described above. Initiate similar projects in other areas of the State.

Contact:
Sara Hunt
Division of Governmental Coordination
P.O. Box 110030
240 Main Street, Suite 500
Juneau, Alaska 99811-0300
Phone: 907.465.8788
Fax: 907.465.3075
E-mail: Sara_Hunt@gov.state.ak.us

American Samoa

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: Medium
1997 Assessment: High

Issue Characterization

Population densities in parts of the territory are increasing rapidly (having more than doubled over the last two decades in one region). This rapid residential and industrial expansion highlights the need for a comprehensive planning and permitting capability that will address cumulative and secondary impacts, rather than considering the impact of only one project at a time. Nonpoint pollution is a major threat, particularly with regard to the groundwater aquifer; encroachment on wetlands and other sensitive areas is another major concern, as is protection of archaeological sites. There is a growing concern in the territory that the rate and type of growth (e.g., a shift from communal living in traditional structures to nuclear families in euro-American style homes) is having an overall cumulative and negative impact on the quality of life in American Samoa.

State Activities 1992 to 1996

Regulatory controls: The legislature is considering adopting mandatory compliance with the Uniform Building Code.

Regulatory Changes: The adoption of American Samoa's Coastal Management Program's (ASCMP) Administrative Rules in 1994 and amendments in 1997 have led to increased scrunity of impacts of development in the Territory. The formulation of the ASCMP and the Territory's Environmental Protection Agency's nonpoint source pollution program in 1993 has also provided guidelines and management measures to curtail such development impacts.

Planning (comprehensive planning): The recently reactivated Territorial Planning Commission (TPC) will review and approve all planning documents for the territory. In addition, the TPC is required to consider alternate development strategies and review cumulative and secondary impact issues.

Obstacles/Needs

Existing development patterns: Traditional patterns of development, combined with the heavy American influence of recent decades, have led to a low-density/land-intensive approach to development and a lack of employment centers outside the main harbor area, combined with a high growth rate, shrinking land base, and lack of sufficient infrastructure.

Management tools: Certain management tools are lacking, such as effective and culturally appropriate community planning, consistent compliance with building codes, reliable population data, long-range planning; management mechanisms that provide effective guidelines and policy capable of creating the quality of society for which the territory is striving.

Data collection and analysis: There is a need for regular integration of data collection and analysis throughout the government.

Summary of Strategy

Planning (comprehensive planning): The American Samoa Coastal Management Program plans to address cumulative and secondary impacts by working with the TPC to adopt master plans and development standards for use by the territory's multi-agency development permitting body, the Project Notification and Review System.

Assessment (advisory groups): The ASCMP and territorial Department of Commerce plan to produce a report on cumulative and secondary impacts for use by the TPC, and to establish a Statistics Advisory Task Force and a Curriculum Development Project.

Contact:
Lelei Peau, Coastal Program Manager
Department of Commerce
Government of American Samoa
Pago Pago, American Samoa 96799
Phone: (011)-684-633-5155
FAX: (011)-503-731-4068
E-mail: lelei.peau@czm.noaa.gov

California

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

California has experienced and is projected to continue experiencing rapid population growth and urbanization (since 1970, population in Monterey and Santa Cruz counties has increased by 62 percent). Much of the California coast has sensitive areas such as dunes, erodible bluffs, wetlands, riparian vegetation, tidepools, forests, coastal scrub, sage, and grasslands susceptible to cumulative impacts. Loss of public access through incremental armoring of the coast and increases in use is an additional concern in California.

The California Coastal Act specifically requires review of cumulative impacts. Generally such review occurs through implementation of statewide policies at the local decisionmaking level; there is, however, a need to upgrade the ability of local plans to address cumulative impacts.

State Activities 1992 to 1996

Assessment (impact assessment): The *California Regional Cumulative Assessment Project (ReCAP)* is a methodology, applied to date in the Elkhorn Slough watershed of Monterey County, that was used for assessing and addressing cumulative impacts from polluted runoff generated by development and other land use activities. **(Section 309)** ReCAP will be implemented through the periodic review of local coastal management programs, a process that will also be implemented regionally to enhance the ReCAP effectiveness.

Information management (database development): Coastal Commission staff developed the first phase of a comprehensive database to track development proposals acted on by the Commission. **(Section 309)**

Information management (information exchange): The California Coastal Commission has also undertaken a pilot project to facilitate exchange of data among agencies in Monterey Bay and to enhance the ability of state and local government planners to manage cumulative impacts through review of development proposals.

Technical assistance (guidance documents): The California Coastal Commission has developed several guidance documents to help Commission staff and local government planners manage cumulative impacts on water quality, wetlands, and public access.

Obstacles/Needs

Legislative and financial support: Legislative and financial support are needed for carrying out the ReCAP program and for analyzing buildout projections and their probable cumulative impacts throughout the coast.

Legal authority: Authority is needed for the California Coastal Commission to require amendments to local coastal plans or to provide incentives for local governments to amend their plans based on Commission recommendations.

Collaborative planning/coordination: Strategies are needed to link local coastal program improvements to the increasing number of watershed planning and management and growth management efforts within the state but falling outside the coastal zone as designated under the California Coastal Management Program.

Summary of Strategy

California will initiate a second-generation assessment of growth in the Malibu/Santa Monica coast region. The ReCAP framework will allow the commission to assess the cumulative impacts of development on a range of coastal issues and develop appropriate mechanisms to address identified problems. Such mechanisms are likely to include procedural improvements, local plan changes, providing technical assistance to local governments, permitting and regulatory changes, and interagency coordination. The state also plans to complete regional periodic reviews in other areas of the coastal zone and to implement the Monterey Bay-area and statewide changes that have been recommended to date under the ReCAP Pilot Project.

Contact:
Liz Fuchs
California Coastal Commission
45 Fremont Street
Suite 2000
San Francisco, CA 94105-2219
Phone: 415.904.5200
Fax: 415.904.5400
fuchs@coastalcomm.ca.gov

Commonwealth of the Northern Mariana Islands

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: Medium
1997 Assessment: High

Issue Characterization

Many small and medium size developments are occurring on the island of Saipan without adequate zoning, management, or review. Government administrative changes in the past years have reduced the effectiveness of environmental review under existing laws. Most pointedly, there is presently no zoning program for the islands; as a result, development out of the Coastal Resource Management Program's jurisdiction generally occurs without adequate setbacks, buffers, separation of conflicting uses, and determination of sufficient infrastructure and capacity. Impacts of concern include runoff, habitat loss, traffic congestion, aesthetic impacts, solid waste issues, and increased demand for public services.

State Activities 1992 to 1996

A Habitat Conservation Plan for Rota was developed. The Saipan Lagoon Use Management Plan was developed.

Obstacles/Needs

Legal authority: Inadequate authority arising from lack of a zoning program for the Commonwealth and from limitation of the coastal program's jurisdiction to review major projects or projects located outside an Area of Particular Concern (APC) or the major siting designation hinder the ability to address cumulative and secondary impacts in the CNMI.

Summary of Strategy

The CNMI's CSI strategy is to develop policies, authorities, and modifications that will incorporate elements of the defunct CNMI zoning program into the coastal management program. The Coastal Resource Management Division already has the administrative capabilities of a permitting system, and proposes to incorporate zoning into this review. In general, large scale projects receive adequate review. The major gap in environmental review is of medium scale development and of any coordinated effort to address cumulative and secondary impacts.

Contact:
John Jordan
Commonwealth of the Northern Mariana Islands
Coastal Resources Management
Office of the Governor
2nd Floor Morgen Building
San Jose Saipan, Mariana Islands 96950
Phone: (011) 670.234.6623
Fax: (011) 670.234.0007
E-mail: crm.jjordan@saipan.com

Guam

309 Cumulative and Secondary Impacts Enhancement Grants Summary

1992 Assessment: Medium
1997 Assessment: High

Issue Characterization

Tumon Bay, Guam's primary tourism and hotel center, continues to undergo rapid growth, with increases in impervious surface and nonpoint source load affecting water quality, solid waste, and flooding. Construction of new golf courses continues to affect water quality and to have secondary impacts, such as increased residential construction. Shipping and boating activities may have cumulative impacts of concern in primary harbors on Guam.

State Activities 1992 to 1996

Planning (comprehensive planning): 2010 Highway Masterplan for highway upgrading in Guam includes provision for proper storm drainage and erosion protection measures.

Planning (comprehensive planning): The I'Tanota Masterplan was approved in the spring of 1998. It is hoped that this plan, which will be fully implemented in 1999, will make development more predictable and controlled and provide additional environmental regulation.

Summary of Strategy

Guam's CSI strategy focusses on assessment and management of soil contamination accumulated during past military and industrial use of harbors. A four-year project will identify levels of contamination in submerged soils, analyze toxic contamination, develop guidelines and legislation for curtailing additional toxification and for dredge spoil disposal, and develop procedures for reporting and analyzing cumulative and secondary impacts through the development review and permitting system of the Government of Guam.

Obstacles/Needs

Baseline data: Baseline data on environment, impacts of military actions, impacts from shipping and boating practices are inadequate.

Public understanding: Public understanding of development impacts to the environment needs to be improved.

Contact:
Mike Ham, Administrator
Guam Coastal Management Program
Bureau of Planning
Government of Guam
P.O. Box 2950
Agana, GU 96910
Phone: (011) 671.472.4201
Fax: (011) 671.477.1812
E-mail: mham@kuentos.guam.net

Hawaii

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

Hawaii has experienced rapid population growth over the past several decades, and the state continues to encourage and support growth in the tourism industry. The rate of growth has slowed somewhat recently, but shoreline and inland development will continue to cause nonpoint pollution and other cumulative and secondary impacts. Specific issues of concern include impacts of recreation (e.g., on coral reefs); use conflicts between residents and tourists; changes in land use resulting from decline in the sugar and pineapple industries; and development of new urban centers.

State Activities 1992 to 1996

Assessment (resource assessment); Planning (special area planning): The Office of State Planning reviewed all state Land Use District boundaries and, in the process, identified important and sensitive wetlands, pristine streams, and other resources in need of protection. Boundary amendments will be recommended to change the designation of these areas to conservation.

Planning (watershed planning): Several watershed planning efforts have been underway in Hawaii over the past few years, all of which have led to new data, procedures, or increased awareness of watershed management issues and cumulative and secondary impacts.

Assessment (policy recommendations): A project to address cumulative and secondary impacts of polluted runoff into streams and coastal waters resulted in recommendations for the gradual implementation of mechanisms to establish state policy in riparian areas and the passage of legislation to establish enforceable land use policies to reduce polluted runoff. **(Section 309)**

Obstacles/Needs

Baseline data: There is a shortage of baseline data, sustainable capacity data, and resource value data; further, existing GIS data is not readily accessible, and is incomplete or outdated in many areas; monitoring of environmental indicators is also inadequate.

Legal authority: The land use regulatory scheme in the state has become outmoded in some areas; the state environmental impact review statute and regulations do not adequately address cumulative and secondary impacts.

Governmental coordination: There is a lack of coordination among permitting, regulatory, and management agencies with respect to policies regarding tourism promotion and growth and resource protection and management.

Political will: There is a lack of political will to engage in meaningful land use and growth management planning.

Summary of Strategy

The Hawaii CSI strategy is to develop new and revised authorities to carry out the programmatic recommendations of the coastal nonpoint pollution control program management plan. Changes may include new or revised statutes, administrative rules, ordinances, and regulations; and nonregulatory programs.

Contact:
Douglas Tom
Hawaii Coastal Zone Management Program
Office of Planning
P.O. Box 2359
Honolulu, HI 96804
Phone: 808-587-2875
FAX: 808-587-2899
E-mail: dtom@dbedt.hawaii.gov

Oregon

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: Medium

Issue Characterization

Population growth in coastal Oregon has been modest overall but high in certain locations. Resources most subject to cumulative and secondary impacts are rocky intertidal shorelines, coastal bluffs, beaches, dunes, and other areas subject to natural hazards, and riverine salmonid habitat.

State Activities 1992 to 1996

Governmental coordination and planning: The state of Oregon developed the Coastal Salmon Restoration Initiative, a plan for collaborative efforts among federal, state, and local agencies, watershed councils, industry, and citizens to restore native coastal salmon and trout populations in Oregon.

Regulatory controls: Statewide land use planning goal 5 in Oregon protects Natural Resources, and the goal was recently revised to provide riparian corridor protections that will positively affect the management of salmon habitat and coastal streams and estuaries in general.

Obstacles/Needs

None

Summary of Strategy

Oregon does not have a specific CSI strategy for coastal communities. It has required comprehensive planning and zoning by all coastal cities and counties since 1973. Oregon planning law requires all coastal cities and counties to reevaluate their comprehensive plans and ordinances every four to seven years to assure plans are updated to reflect new information and changing needs and circumstances. Coastal program staff assists local governments to prepare work programs, reviews and approves work task products, and reviews revised plan and ordinances for consistency with the Statewide Planning Goals.

Contact:
Don Oswalt
Coastal Ocean Program
Dept. of Land Conservation and Development
635 Capitol Street NE, Suite 200
Salem, Oregon 97301-2540
Phone: 503-373-0050
FAX: 503-378-6033
E-mail: don.oswalt@state.or.us

San Francisco Bay Conservation and Development Commission
309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

With urban land use in the San Francisco Bay and the Sacramento-San Joaquin River Delta region expected to grow 25 percent by 2005, pollutant levels from all sources can be expected to rise. Decreased fresh water flows into the Delta will further concentrate pollutants throughout the region. There is no comprehensive land use planning and regulatory authority for the Bay region.

State Activities 1992 to 1996

Planning: Management of the dredging required to maintain the Bay area's maritime economy in a manner that protects the Bay's environmental resources is a high priority of the Commission. BCDC is working with U.S. EPA, the Army Corps of Engineers, the State Water Resources Control Board, and others to develop a Long Term Management Strategy (LTMS) for dredging.

Coordination: The CALFED Bay Delta Program is a federal-state partnership to develop an integrated system to improve management of the natural and economic resources of San Francisco Bay and the Sacramento-San Joaquin River Delta. The interagency cooperative effort is addressing development of water quality standards; operations of the State Water Project and federal Central Valley Project; and development of long-term solutions to Bay-Delta estuary resource problems.

Regulatory controls (regulatory reform and permit streamlining): As part of a Governor's initiative, the Commission changed a number of its regulations; established a new, abbreviated regionwide permit; and increased the types of activities that could be authorized under a regionwide permit.

Obstacles/Needs

There is a need to develop a Geographic Information System (GIS) resource and permit monitoring system to enable the Commission to map areas that are high priority for development. The Commission could work with the Regional Water Quality Control Board and local governments to curb impacts of development outside of the Commission's jurisdiction through watershed planning. The BCDC should work more closely with the State Lands Commission on leases on trust properties.

Summary of Strategy

The Commission will continue to work closely with its LTMS partners to prepare the final environmental impact statement for the dredging program and to establish a joint office for review of dredging and disposal permit applications. The Commission will focus on preparing the comprehensive management plan for implementation of the LTMS. The Commission should expand its involvement in the CALFED restoration program for the Bay and in improving the quality of water entering the Bay.

Contact:
Will Travis
SF Bay Conservation and Development Commission
30 Van Ness Avenue, Room 2011
San Francisco, CA 94102
Phone: 415-557-3686
FAX: 415-557-3767
E-mail: travis@bcdc.ca.gov

Washington

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

Population growth in the Puget Sound region is leading to residential development and sprawl with adverse cumulative effects on habitat, water quality, flooding, and demand for infrastucture. Development activities contributing to these impacts include shoreline armoring, landscape clearing, removal of native vegetation, construction of private docks and piers, and on-site sewage disposal systems.

State Activities 1992 to 1996

Regulatory controls; Coordination: Washington passed a Growth Management Act (GMA) in 1990, and GMA significant integration amendments in 1995. The Growth Management Project, designed to respond to the GMA, has addressed cumulative and secondary impacts issues, including development of model shoreline and coastal zone policies addressing cumulative and secondary impacts. The emphasis of the project has since shifted to a response to mandates under regulatory reform legislation and more recently to respond to Endangered Species Act salmon listing notices as a part of the state's Salmon Recovery Strategy. **(Section 309)**

Contact:
Peter Skowlund
Shorelands & Coastal Zone Management Program
Washington Department of Ecology
P.O. Box 47600
Olympia, WA 98504-6522
Phone: 360 - 407-7280
Fax: 360 - 407 - 6535
psko461@ecy.wa.gov

Obstacles/Needs

Regulatory reform: There is a need to complete work begun in response to regulatory reform amendments requiring integration of the original Shoreline Management Act and the 1990 Growth Management Act. This integration will involve workshops for local government, drafting of technical assistance papers, developing model text for integration of the acts, internal education, and internal and external (local government) amendment and permit review guidelines.

Habitat loss: An emerging issue in Washington is the cumulative and secondary impact of development on embayments of Puget Sound. These impacts manifest themselves in chronic habitat loss in the ecotone between the Puget Sound uplands and the marine waters of Puget Sound.

Summary of Strategy

Regulatory controls; Technical assistance: The state of Washington plans to approach cumulative and secondary impacts by focusing on updating guidelines for Shoreline Master Programs rules containing fiscal impact analysis and state environmental protection act documentation required for any rule adoption in the state. Technical assistance materials for local governments will also be developed, with workshops and field seminars.

great lakes

Michigan

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

Counties along the Great Lakes shoreline and connecting waterways face common issues related to cumulative and secondary impacts of development. Coastal areas of Michigan are being developed in general at a faster rate than inland areas, and although some regions are growing faster than others, there are hot spots of growth in every county. Most regions are experiencing sprawled development. Cumulative impacts of concern include conversion of farmland, forests, and open space to residential use; fragmentation of ecosystems and coastal habitat; loss of public access; loss of sensitive coastal features; development in high hazard areas; and degradation of water quality.

State Activities 1992 to 1996

Assessment: The *Michigan Trend Future Report* documented land use trends in the state and contained eleven separate research papers on the issues of land use, agriculture, natural resources and the environment, minerals, public lands and forestry, tourism and recreation, transportation, infrastructure, jobs and the built environment, demographics, and institutional structure for land use decision making. A follow-up study, the *Michigan Fiscal Impact Study*, compared the cost of current land use trends to more compact development patterns in eighteen communities that volunteered to participate. Software for a Fiscal Impact Model was developed that can be used by other communities throughout the state. **(Section 309)**

Planning (purchase of development rights): The coastal program supported a purchase of a development rights demonstration project in Peninsula Township, Grand Traverse County. The township developed criteria for identifying prime and unique farmland, created a Geographic Information System, prepared educational materials and videos, revised its master plan and zoning ordinance, identified purchase, transfer, and receiving zones, created a fast track permit review system for village centers, and developed a capital improvement program. **(Sections 306/309)**

Regulatory controls: Several bills addressing land use issues were likely to be enacted: a subdivision control plat act and a purchase of development rights act.

Obstacles/Needs

Public understanding: The public perception that environmental protection and planning are impediments to economic development needs to be addressed.

Planning: There is a lack of integrated land use planning in the state.

Summary of Strategy

Regulatory controls: The Michigan strategy is to develop new state legislation to amend zoning enabling acts and provide additional tools for local communities to manage and guide growth and protect coastal resources.

Technical assistance (support of local initiatives): The state will support local initiatives to develop, revise, and enhance local procedures or policies. Such support will include encouraging local assumption of state environmental protection statutes, and encouraging revision and/or development of local master plans, zoning ordinances, or land use regulations to address the secondary and cumulative impacts of development on the coastal environment.

Contact:
Cathy Cunningham
Coastal Program Unit
Land & Water Management Division
Dept. of Environmental Quality
Steven T. Mason Bldg., Box 30458
Lansing, MI 48909
Phone: 517-335-3456
Fax: 517.335.3451
E-mail: cunningc@state.mi.us

Pennsylvania

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: Medium

Issue Characterization

The Pennsylvania Coastal Management Program considers cumulative and secondary impacts to be part of a larger issue of sustainable development. A key element to control of cumulative and secondary impacts is adequate land use management. Cumulative and secondary impacts of existing land uses and land use decisions are major factors in the Pennsylvania Great Lakes and Delaware Estuary coastal zones. Protection of open space and habitats is a primary concern in both these areas.

State Activities 1992 to 1996

Assessment (impact assessment): A study of the environmental and social impacts of recreational boating upon Presque Isle Bay found that the impact of boating on the bay was much less severe than was originally thought; some recommendations resulting from the study have been implemented as a proactive strategy to preserve the bay. **(Section 309)**

Planning (National Estuary Program): The Delaware Estuary Program has focused on land use management as one of the key issues in its Comprehensive Conservation and Management Plan. Eighteen actions have been identified to enhance land management initiatives in the region.

Regulatory controls: A new initiative is underway in Pennsylvania consisting of three laws that address unused industrial sites. The legislation is intended to enable such locations to be reused for new industrial activity.

Contact:
Shamus Malone
Depart. Of Environmental Protection
Coastal Zone Management Section
P.O. Box 8555, 400 Market Street, 11th Floor
Harrisburg, PA 17105-8555
Phone: 717-787-5259
Fax: 717-787-9549
E-mail: malone.shamus@a1.dep.state.pa.us

Obstacles/Needs

Inadequate comprehensive planning: Consistency is not required between local plans and their implementing regulations in Pennsylvania, and comprehensive plans developed by counties are only advisory in nature.

Regulatory coordination: No authoritative mechanism exists for dealing with projects of regional impact, and consistency is not required between plans of neighboring areas.

Resource limitations: Professional staffing is limited.

Summary of Strategy

The Pennsylvania Coastal Program will develop and implement a Special Area Management Plan (SAMP) process on its Lake Erie shoreline. Cumulative and secondary impacts will be incorporated as part of the SAMP.

Wisconsin

309 Cumulative and Secondary Impacts Enhancement Grant Summary

1992 Assessment: High
1997 Assessment: High

Issue Characterization

Few local governments consider cumulative and secondary impacts because they lack the resources or jurisdiction. Some state and local programs that do address aspects of cumulative and secondary impacts are sewer service area planning, nonpoint source pollution abatement, and shoreland zoning.

State Activities 1992 to 1996

The Wisconsin Coastal Management Program made a strong effort to educate the public about cumulative and secondary impacts by making funds available for innovative projects dealing with this issue. This was accomplished through public education and outreach, environmental studies, and the development of guidance documents.

Obstacles/Needs

There should be continued support for public information and education initiatives.

Local government regulatory staff, planning and building inspection officials should have access to educational seminars on cumulative impacts of development decisions. Continued effort should be directed toward the creation of a certification program for staff and local officials.

Regional meetings should be established to consider cumulative and secondary impacts of development in specific coastal areas that encompass multiple political jurisdictions.

State programs and statutes must be continued to be reviewed to determine if impacts other than just water quality should be incorporated.

Summary of Strategy

Urban development, nonpoint source pollution, contaminated sediments and other activities which alter natural conditions all need to be considered, and will be addressed by the Wisconsin Coastal Management Program under the broad scope of cumulative and secondary impacts. No Section 309 funding is allocated for cumulative and secondary impact projects; Section 306 funds will be used instead.

Contact:
Diana Toledo, interim contact
Wisconsin Coastal Management Program
Division of Energy and Intergovernmental Relations
P.O. Box 7868
101 East Wilson Street
Madison, WI 53707-7868
Phone: 608-261-8011
Fax: 608-267-6931
E-mail: diana.toledo@doa.state.wi.us

activities

assessment

state activities 1992 to 1996

policy assessment and analysis

AK The Alaska Coastal Management Program has completed a number of analyses of methods for assessing and managing cumulative and secondary impacts. These include a comprehensive overview of how the Program and other Alaska state agencies address cumulative and secondary impacts; surveys and interviews with other coastal states and federal agencies to determine how they manage cumulative and secondary impacts; a survey of Alaska coastal districts, agencies, and others to identify sites or areas affected by cumulative impacts, resources affected, and causes of the impacts; a survey of methodologies for assessing cumulative impacts, considering cumulative and secondary impacts, and implementing decisions; an evaluation of large project permitting; and an evaluation of the usefulness of Geographic Information Systems for determining impacts.

FL The Sustainable South Florida Commission, created by the governor, was charged with assuring a healthy Everglades ecosystem and with developing recommendations to halt and/or reverse cumulative and secondary impacts of development on South Florida environmental resources. Principal recommendations have focused on supporting programs designed to restore components of the South Florida Ecosystem and initiatives to promote environmentally sound development, infill, and redevelopment of the southeast Florida urban core.

HI A project to address cumulative and secondary impacts of polluted runoff into streams and coastal waters in Hawaii resulted in recommendations for the gradual implementation of mechanisms to establish state policy in riparian areas and the passage of legislation to establish enforceable land use policies to reduce polluted runoff.

MI The *Michigan Trend Future Report* documented land use trends in the state and contained eleven separate research papers on the issues of land use, agriculture, natural resources and the environment, minerals, public lands and forestry, tourism and recreation, transportation, infrastructure, jobs and the built environment, demographics, and institutional structure for land use decision making.

A follow-up study, the *Michigan Fiscal Impact Study*, compared the cost of current land use trends to more compact development patterns in eighteen communities that volunteered to participate. Software for a Fiscal Impact Model was developed for use by communities throughout the state.

LA The Louisiana Geological Survey of the Department of Natural Resources developed a report on data gaps for addressing cumulative and secondary impacts. The Louisiana Coastal Management Division is combining information from this study with the newly developed coastal nonpoint program to support modifications to rules and procedures for permitting.

Impact assessment

AK The Kenai River Study, led by the Alaska Department of Fish and Game, was designed to assess and control cumulative impacts along the Kenai River. The project included development and implementation of a cumulative impact assessment methodology using Geographic Information Systems to evaluate the cumulative impacts of shoreline development on juvenile king salmon habitat; analysis of the socioeconomic value of Kenai River salmon fisheries to the local economy; evaluation of the effects of instream structures on fish habitat; and recommendations for a continued approach to assessing and managing cumulative impacts of development on fish habitat.

CA ReCAP, the **California Regional Cumulative Assessment Project** ,implemented to date in the Elkhorn Slough watershed of Monterey County, is a methodology for assessing and addressing cumulative impacts from polluted runoff generated by development and other land use activities. The process involves (1) selecting geographic boundaries for the analysis, identifying priority issues, and inventorying institutions in the region that address land uses and/or water quality; (2) collecting data on land-use characteristics and water quality in the study area, conducting a land use/land cover change analysis and correlating water quality problems with land uses where feasible, and predicting potential problems based on buildout scenarios, land cover/land use change analyses, and analysis of local policies and ordinances; (3) reviewing existing policies, evaluating implementation, and reviewing the ability of policies to address polluted runoff problems; (4) developing short term action plans and longer term implementation strategies, maintaining baseline resource data and maps to measure success of program changes.

CT A boundary review undertaken as part of coastal nonpoint program development in Connecticut resulted in a nonpoint management area boundary beyond the coastal zone boundary and consideration of future expansion of the coastal area up the Connecticut River.

DE An intensive modeling effort was undertaken for the Dover Silver Lake watershed to evaluate the effects of land use on pollutant inputs. Consisting of a Geographic Information Systems interface with a stormwater management model, this effort will allow local land use planners to assess effects of land use decisions within a watershed more scientifically and provide them with more information on which to base decisions.

FL Studies of cumulative impacts of septic tanks on water quality in the Florida Keys prompted programmatic changes concerning the Florida Department of Health and Rehabilitative Services jurisdiction over septic tank permitting. The agency is now allowed to base permitting decisions on water quality impacts as well as on human health considerations. Further studies are underway to test alternative advanced wastewater treatment systems in the Florida Keys.

HI The Office of State Planning reviewed all state Land Use District boundaries and identified important and sensitive wetlands, pristine streams, and other resources in need of protection. Boundary amendments will be recommended to change these areas to special conservation areas.

LA The Louisiana Coastal Management Division (CMD) is developing a standard protocol for measuring impacts of activities. The project involves review of databases, protocol for new data, and correction of old data. Revised procedures will ensure that new habitat impact data are consistent for all regulatory functions.

Another project is analyzing the indirect impacts of pipelines on coastal systems by looking at the complexities of habitat recovery in a marsh environment. In marshes, excavated material generally shrinks after excavation, and a depression often forms and becomes a conduit for tidal exchange. Deeper trenches may convert to open water rather than returning to vegetated wetlands. The CMD has not heretofore had a database of factors such as soil type, vegetation, hydrology, and elevation to direct installation of pipelines or predict rates of habitat recovery, although impacts could be reduced by creating such data bases to assist permit analysts.

MA As part of its coastal nonpoint program development, the Massachusetts Coastal Zone Management Program developed an approach for identifying critical coastal areas, with the goal of determining areas where new or substantially expanding land uses may contribute to current or future impairment of water quality. Threshold criteria for screening and evaluating these areas were developed, and the Program has been working to compile and synthesize information for the development of environmental sensitivity indexes and resource characterization in these areas.

The Waquoit Bay National Estuarine Research Reserve is conducting research to examine cumulative impacts of activities on coastal habitats.

NH New Hampshire carried out a project to assess bacterial and nutrient contamination of tidal waters by subsurface disposal systems. The project involved determining the condition of existing subsurface disposal systems, assessing the level of bacterial and nutrient contamination, and drafting and passing legislation. Other impact assessment projects involved assessing current septic system design criteria on coastal habitats and water quality, and assessing the effectiveness of permanent stormwater control measures.

PA A study of the environmental and social impacts of recreational boating upon Presque Isle Bay found that the impact of boating on the bay was much less severe than originally thought; certain recommendations have been implemented to preserve the bay.

PR The Puerto Rico coastal program developed a procedure for cumulative and secondary impact analysis based on the use of Geographic Information Systems. The process was tested using data for the island of Culebra, and agreement was reached among all the agencies involved to adopt the process after adequate testing and development of a user manual.

309 strategies

policy assessment

AK The Alaska Coastal Management Program strategy includes a project to examine how the regulatory process for a specific type of project addresses cumulative and secondary impacts.

AS The territory of American Samoa plans to complete a report on cumulative and secondary impacts for use by the Territorial Planning Commission.

impact assessment

AK Alaska plans to expand upon current cumulative impact analyses of timber harvest and to strengthen district effectiveness in Coastal Management Program consistency review of timber harvest activities.

The Alaska Coastal Management Program will also continue and expand the Kenai River project.

CA California will initiate a second-generation assessment of growth in the Malibu/Santa Monica coast region. The ReCAP framework will allow the commission to assess the cumulative impacts of development on a range of coastal issues and develop appropriate mechanisms to address identified problems. Such mechanisms are likely to include procedural improvements, local plan changes, providing technical assistance to local governments, permitting and regulatory changes, and interagency coordination. The state also plans to complete regional periodic reviews in other areas of the coastal zone and to implement the Monterey Bay area and statewide changes that have been recommended to date under the ReCAP Pilot Project.

CT Connecticut's strategy is to fine tune existing programs and make use of available Geographic Information Systems and resource information technology. Specific projects include research and analysis on new opportunities in cumulative impact assessment, with the ultimate goal of operationalizing such assessments through regulatory boundaries in discrete geographical areas particularly subject to cumulative and secondary impacts by virtue of sensitive resources, harmful activities, or both.

DE The Delaware coastal program strategy includes an objective to improve analytical and decision support tools for Delaware River and Bay dredging projects and to enhance the beneficial use of dredged material.

GU Guam's strategy for cumulative and secondary impacts focuses on assessment and management of soil contamination accumulated during past military

and industrial use of harbors. A four-year project will identify levels of contamination in submerged soils, analyze toxic contamination, develop guidelines and legislation for curtailing additional toxification and for dredge spoil disposal, and develop procedures for reporting and analyzing cumulative and secondary impacts through the development review and permitting system of the Government of Guam.

MA The priorities of the Massachusetts strategy for improving management of cumulative and secondary impacts are to develop and implement programs and standards to improve abatement of nonpoint pollution, to develop and implement a coastal monitoring plan, and to develop better abilities to track land use changes and manage water quality data.

NH A study will be undertaken to determine whether stormwater control structures are acting as bacteria generators; results of the study will be used in re-evaluation of stormwater control rules and changes as necessary to reflect the results of the study.

To fully implement newly enacted regulations regarding septic system site assessment, a Tidal Water Site Assessment Form needs to be developed. In addition, a system needs to be developed to manage and analyze the data gathered on these forms.

NC North Carolina proposes to develop guidelines for consideration of cumulative impacts in Coastal Area Management Act permit decisions for as many Area of Environmental Concern categories as feasible. Accomplishing this project will include redesigning the Coastal Area Management Act permit tracking system and integrating it with the Division of Coastal Management Geographic Information Systems; analyzing specific permit activities and their impact on resource areas; and developing guidelines for assessing cumulative and secondary impacts.

PR Puerto Rico plans to expand its Geographic Information Systems for cumulative and secondary impact assessment to additional areas of the island. Permit review will then be based on a common analytical approach adopted by all relevant agencies. Priority for initial implementation will be watersheds in special planning areas. A common database will be available to agencies involved in permitting.

SC The major piece of the South Carolina strategy is the development of a comprehensive coastal management plan to measure, assess, and manage cumulative and secondary impacts, taking into consideration local community values and outlook. The plan will emphasize the interface between upland development and adjacent estuarine areas, with a focus on small tidal creeks. An objective of the project is to determine if there is a quantifiable level where impacts accumulate to a detectable adverse limit.

Another element of the strategy is to conduct a feasibility assessment for developing and implementing a septic system maintenance program for local communities, to develop and adopt site evaluation and design standards for large-scale and cluster onsite systems in the coastal zone, and to develop a series of informational workshops for contractors and developers.

planning

state activities 1992 to 1996

comprehensive planning

AS The recently reactivated Territorial Planning Commission will review and approve all planning documents for the territory. In addition, the Commission is required to consider alternate development strategies and to review cumulative and secondary impact issues.

GU The 2010 Highway Masterplan for highway upgrading in Guam includes provision for proper storm drainage and erosion protection measures.

The I'Tanota Masterplan was approved in the spring of 1998. It is hoped that this plan, which will be fully implemented in 1999, will make development more predictable and controlled and provide additional environmental regulation.

FL A Florida statute requiring local governments to include consideration of cumulative and secondary impacts in coastal management elements of local comprehensive plans was incorporated into the state's federally approved coastal management program.

RI The statewide Municipal Comprehensive Planning Program and associated enabling acts may be viewed as an integrated approach to state oversight over land use planning, including cumulative and secondary impacts. The act requires that local zoning ordinances be amended to consider allocation of land uses and of optimum intensities and standards based upon considerations that include natural land characteristics and impacts on surface and groundwater, wetlands, coastal features, and other sensitive and fragile natural resources.

VA The original 309 Assessment for Virginia contained a suggestion to broaden the role of regional entities such as Planning District Commissions (PDC). Several initiatives to strengthen the role of PDCs were submitted to the 1997 General Assembly. Regional activities, such as the Sustainability Council in the Thomas Jefferson Planning District, and regional nonprofits such as the Elizabeth River Project, have also increased significantly.

watershed/ecosystem planning

CNMI A Habitat Conservation Plan for Rota was developed. The Saipan Lagoon Use Management Plan was developed.

CT An ongoing watershed planning initiative in Connecticut will result in a reorientation and coordination of planning and regulatory programs along watershed boundaries. Two pilot watershed management planning studies are underway.

DE A Whole Basin Approach to watershed management is being developed and will look sequentially at the five major basins in Delaware and provide a framework in which to evaluate watershed health and activities.

FL The state of Florida has been divided into twenty-four ecosystem management areas, most of which have either coastal attributes or include river systems that eventually feed into coastal waters. Within each management area, the Department of Environmental Protection has allowed latitude in how staff implement ecosystem management.

HI Several watershed planning efforts have been underway in Hawaii over the past few years, all of which have led to new data, procedures, or increased awareness of watershed management issues and cumulative and secondary impacts.

ME The Maine coastal program initiated efforts in 1992 to encourage cities and towns to work together to understand the cumulative impacts of development in a regional context and improve the management of shared coastal resources, such as estuaries. A three-year demonstration project was funded in the Damariscotta River Estuary, which resulted in a management plan detailing fifty actions to sustain the high quality of the estuary and its watershed. These actions are now being implemented by a new planning alliance formed by the planning boards of the seven municipalities.

MD Development of Tributary Strategies to achieve the nutrient reduction targets in the Chesapeake Bay has enhanced Maryland's ability to address cumulative and secondary impacts. Developing the strategies involved characterizing the watersheds, analyzing management options, developing a comprehensive strategy, and creating tributary teams to assist with implementation.

MA The Massachusetts Watershed Initiative has created a water resource decisionmaking framework. Basin teams with representatives from several state agencies have been established for the state's twenty-seven major watersheds to assess and evaluate water quality within each basin.

NH The coastal program has initiated a watershed approach to addressing nonpoint sources. Together with local planning commission and watershed committees, the coastal program will work to identify nonpoint source problems and review land use controls. In a watershed where a similar process was used, computer models were also employed to identify water quality impacts of various development scenarios.

NJ The Department of Environmental Protection is developing a Statewide Watershed Management Framework, which will provide for application of regulations, policies, and standards on a watershed basis, rather than statewide.

NY Plans for two small watersheds, both important embayments on the north shore of Long Island, are being developed.

A comprehensive plan was developed to address cumulative and secondary impacts to the Long Island Sound region. As part of this process, smaller subregions were identified, and plans covering these smaller geographic areas have been developed or are being developed.

NC The North Carolina Division of Water Quality is implementing a basinwide approach to managing water quality, intended to improve efficiency, effectiveness, and consistency of the state's surface water quality protection program. Under this approach, all water quality programs including permitting, monitoring, modeling, nonpoint source assessments, and planning are coordinated and integrated by river basin.

RI The Salt Pond and Narrow River Special Area Management Plans are currently being updated to reflect new water quality and land use data. A study on cumulative and secondary impacts for the two areas will provide new groundwater, nutrient loading, and buildout analysis data that will be the basis for any regulation and boundary revisions. It will also provide new Geographic Information System coverages within these watersheds. Recommendations for changes in zoning may be made as a result of the new data.

Another program, the Narragansett Bay Project, involves the restoration of Greenwich Bay, which has been closed to shellfishing since December of 1992. The Rhode Island Department of Environmental Management and the local government, city council, and other groups are coordinating to identify and remediate the bay's various pollution sources.

other

BCDC Management of the dredging required to maintain the Bay area's maritime economy in a manner that protects the Bay's environmental resources is a high priority of the commission. BCDC is working with U.S. EPA, the Army Corps of Engineers, the State Water Resources Control Board, and others to develop a Long Term Management Strategy for dredging.

MI The coastal program supported a purchase of development rights demonstration project in Peninsula Township, Grand Traverse County. The township developed criteria for identifying prime and unique farmland, created a Geographic Information System, prepared educational materials and videos, revised its master plan and zoning ordinance, identified purchase, transfer, and receiving zones, created a fast track permit review system for village centers, and developed a capital improvement program.

NH The New Hampshire Port Authority was charged with developing a long-range plan and schedule to guide individual dredging activities.

OR The state of Oregon developed the Coastal Salmon Restoration Initiative, a plan for collaborative efforts among federal, state, and local agencies, watershed councils, industry, and citizens to restore native coastal salmon and trout populations in Oregon.

VA Open space initiatives in Virginia have increased under a variety of organizations, such as the Virginia Outdoors Foundation, an independent state agency, and private groups such as The Nature Conservancy, Friends of Dragon Run, the Chesapeake Bay Foundation, and the Williamsburg Land Conservancy.

national estuary program

CT The Long Island Sound National Estuary Program Comprehensive Conservation and Management Plan was issued in March 1994. The plan identified six priority issues and suggested policies and procedures to address them.

DE The Comprehensive Conservation and Management Plan for the Delaware National Estuary Program was recently adopted.

ME The Casco Bay National Estuary Program is addressing the cumulative impacts of development on coastal resources. The Casco Bay project is a collaborative effort between federal, state, and local governments, businesses, and local environmental groups. The management plan for the estuary was completed in 1996.

MD Maryland's Atlantic Coastal Bays Watershed was designated as part of the National Estuary Program in 1995, and a Comprehensive Conservation and Management Plan is being developed to improve water and habitat quality, restore and create habitat, and achieve other goals.

MA Massachusetts Bays and Buzzards Bay National Estuary Program strategies are being implemented.

NH In 1995, New Hampshire Estuaries were designated as part of the National Estuary Program. The management plan for this National Estuary Program will focus on water quality and shellfish resource issues. Nonpoint source pollution abatement and prevention is a major thrust of this work.

NJ The Barnegat Bay National Estuary Program Comprehensive Coastal Management Plan has involved efforts to coordinate county, local, and federal level management of resources within the watershed.

PA The Delaware Estuary Program has focused on land use management as one of the key issues in its Comprehensive Conservation and Management Plan. Eighteen actions have been identified to enhance land management initiatives in the region.

309 strategies

comprehensive planning

AS The American Samoa coastal management program plans to address cumulative and secondary impacts by adopting master plans and development standards for use by the territory's land use permitting body, the Project Notification and Review System.

BCDC The Commission will continue to work closely with its Long Term Management Strategy partners to prepare the final environmental impact statement for the program. The Commission will focus on preparing the comprehensive management plan for implementation of the program. The Commission will also remain involved in the CALFED program.

CA California plans to continue implementation of the ReCAP strategy by carrying out regional periodic reviews in additional areas of the coastal zone. The ReCAP framework will allow the Commission to assess the cumulative impacts of development on a range of coastal issues and develop appropriate mechanisms to address identified problems. Such mechanisms are likely to include procedural improvements, local plan changes, permitting and regulatory changes, and interagency coordination. The state also plans to implement the Monterey Bay-area and statewide changes that have been recommended to date under the ReCAP Pilot Project.

MS The state, together with other stakeholders, will undertake a Rural Wastewater Initiative to develop policies, plans and resources, and design recommendations that will enable local governments to expand the delivery of wastewater treatment capacity to the rural areas of coastal counties not currently serviced, regulated, or managed by an existing private or public wastewater organization.

watershed/ecosystem planning

AL Alabama proposes to investigate watershed management options for addressing cumulative impacts. Because many activities beyond the 10-foot contour of the Alabama coastal zone boundary affect coastal resources it is necessary to ascertain opportunities or mechanisms for watershed management to address these impacts upon the coastal area. The possibilities of creating a formal watershed authority or of managing through networking of agencies and government entities under a SAMP will be evaluated.

DE The Delaware Coastal Management Program will continue to support the state's Whole Basin Management Approach.

ME The state of Maine is embarking on an effort to create coalitions among local and regional groups to better address existing and potential natural resource problems in priority watersheds throughout the state. Program changes may include new guidelines and procedures to direct collaboration between state agencies on watershed projects; new or revised local ordinances that are more consistent and improve resource protection; new watershed organizations; and new funding sources.

To complement the watershed effort, the coastal program plans to organize teams of state agency staff from various departments to serve as a clearinghouse and single point of contact for local groups to obtain assistance in data, maps, and other natural resource information; state and federal technical and financial assistance; and volunteer training.

NJ New Jersey intends to develop a sustainable watershed management framework in an attempt to balance human use of land and water systems to ensure the community is living within the carrying capacity of the natural system. The state has identified individual watershed management areas in which management strategies will be developed.

NY Several communities on Long Island and in other areas of the state have expressed interest in working with state agencies to develop Maritime Center Plans. These plans will help stabilize and, in some instances, encourage those aspects of coastal resource use for

which the areas are especially suited. The state also plans to initiate planning for additional Outstanding Natural Coastal Areas on Long Island and in other parts of the state. Cumulative and secondary impacts will also be addressed through brownfields rehabilitation plans.

PA The Pennsylvania Coastal Program will develop and implement a Special Area Management Plan process on its Lake Erie shoreline. Cumulative and secondary impacts will be incorporated as part of the Plan.

USVI To address cumulative and secondary impacts, the Virgin Islands coastal program will develop and implement a watershed management plan that will address urban runoff control practices and pollutant reduction strategies and techniques. The plan will protect the integrity of natural drainage systems and waterbodies to the extent feasible. Techniques such as establishing buffers along surface waterbodies and their tributaries will minimize conversion of areas that are particularly susceptible to erosion and sediment loss.

VA The Virginia strategy focuses on development of two Special Area Management Plans: one for the Southern Watershed Area and one for Northampton County, on the Eastern Shore. Primary management issues in the southern watershed area are existing threats to water quality; habitat loss and other threats from new development; and water use, land use, and management conflicts. Specific goals of the Special Area Management Plans include refining development controls to protect water quality and preserve critical habitat; improving the use of preservation districts; protecting habitat through conservation easements and other techniques; improving public access to natural resource areas; and improving agricultural Best Management Practices.

information management

state activities 1992 to 1996

CA The California Coastal Commission staff have developed the first phase of a comprehensive database to track development proposals acted on by the Commission.

The Commission has also undertaken a pilot project to facilitate exchange of data among agencies in the Monterey Bay area and to enhance the ability of state and local government planners to manage cumulative impacts through review of development proposals.

CT Connecticut has developed Geographic Information Systems and databases for regulatory and resource information.

DE Database projects in Delaware have included spatial tracking of federal consistency certifications and determinations and Coastal Ocean Management, Planning and Assessment System Delaware, which will allow managers to bring disparate coastal resource data into a single desktop system for comparison, display, and analysis.

FL Two sets of environmental indicators have been developed in Florida: one addresses statewide issues and the other coastal issues. Both attempt to compile baseline data in a single document so that future cumulative impacts can be measured against them. The project has also identified shortcomings in existing data.

As part of its Ecosystem Management Initiative, the Florida Department of Environmental Protection, is seeking to establish indicators for the designated ecosystem management areas in Florida. The Department of Environmental Protection and water management districts are also preparing a set of performance indicators for water management.

LA The Louisiana Geological Survey of the Department of Natural Resources developed a report on gaps in data for addressing cumulative and secondary impacts.

NJ An effort has been ongoing in New Jersey to develop greater coordination in development of data layers and to bring data needs to greater awareness, although lack of data remains an issue coastwide. Grant funds have also been used to provide coastal communities with funds to develop digital data sets of community resources.

NC North Carolina has established the Population, Development, Resource Information System, a comprehensive database of information related to population growth, economic development, and natural resources in the North Carolina coastal area. The information is organized on a small watershed basis for use in identifying areas at high risk of adverse cumulative impacts.

PR The Puerto Rico coastal program developed a procedure for cumulative and secondary impact analysis based on the use of Geographic Information Systems. The process was tested using data for the island of Culebra, and agreement was reached among all the agencies involved to adopt the process after adequate testing and development of a user manual.

SC A Geographic Information System containing information on archaeological and historic resources, master plans, past permits, and other actions on a particular site has been incorporated into permit review, allowing the South Carolina Coastal Program to highlight sensitive areas in the coastal zone and to review past actions on particular sites.

309 strategies

AL Alabama proposes to develop and implement a strategy to coordinate existing water quality monitoring, wetlands and habitat resources monitoring, and other monitoring programs, and to identify information needs and gaps and a strategy for information sharing.

CT Connecticut's strategy is to fine tune existing programs and make use of available Geographic Information Systems and resource information technology. Specific projects will include research and analysis on new opportunities in cumulative impact assessment, with the goal of utilizing such assessments in areas and jurisdictions especially subject to cumulative and secondary impacts because sensitive resources, harmful activities, or both, are present.

MA The priorities of the Massachusetts strategy for improving management of cumulative and secondary impacts are to develop and implement programs and standards to improve abatement of nonpoint pollution, to develop and implement a marine monitoring plan, and to develop better abilities to track land use changes and manage water quality data.

MS Mississippi plans to develop a comprehensive water quality monitoring strategy.

NH To fully implement newly enacted regulations regarding septic system site assessment, a Tidal Water Site Assessment Form needs to be developed. In addition, a system needs to be developed to manage and analyze the data gathered on these forms.

NC North Carolina proposes to develop guidelines for consideration of cumulative impacts in coastal permit decisions for as many Areas of Environmental Concern categories as feasible. Accomplishing this project will include redesigning the coastal permit tracking system and integrating it with the Division of Coastal Management's Geographic Information System; analyzing specific permit activities and their impact on resource areas; and developing guidelines for assessing cumulative and secondary impacts.

PR Puerto Rico plans to expand its Geographic Information System for cumulative and secondary impact assessment to additional areas of the island. Permit review will then be based on a common analytical approach adopted by all relevant agencies. Priority for initial implementation will be watersheds in special planning areas. A common database will be available to agencies involved in permitting.

technical assistance

state activities 1992 to 1996

AL Numerous BMP manuals have been prepared and distributed to address nonpoint pollution.

CA The California Coastal Commission has developed several guidance documents to help commission staff and local government planners manage cumulative impacts on water quality, wetlands, and public access.

ME The Maine coastal program publishes a citizen's guide to coastal watershed surveys to assist volunteer citizens' groups in identifying and addressing pollution sources in their watersheds.

MD The Maryland Office of Planning initiated a **Models and Guidelines** publications series, under which more than twelve documents have been prepared and distributed to date on topics such as sensitive area protection, regulatory streamlining, cluster development, transferrable development rights, and urban growth boundaries. Workshops on related topics have also been held.

MS Comprehensive marina siting and development guidelines have been prepared, incorporating state of the art standards to address nonpoint source pollution.

NC The North Carolina Division of Coastal Management compiles customized information packages for local governments to use in land use planning. Information is gathered from state and federal agencies and organized to correspond with the state land use planning guidelines.

SC South Carolina has developed guidelines for septic tank design in or near sensitive coastal waters.

WI The Wisconsin Coastal Management Program made a strong effort to educate the public about cumulative and secondary impacts by making funds available for innovative projects dealing with this issue. This was accomplished through public education and outreach, environmental studies, and the development of guidance documents.

309 strategies

AL Alabama will develop an outreach and educational strategy to encourage local officials to utilize best management practices for urban runoff, construction site erosion and sediment control, and other nonpoint source management issues.

CA California will initiate a second-generation assessment of growth in the Malibu/Santa Monica coast region. The ReCAP framework will allow the commission to assess the cumulative impacts of development on a range of coastal issues and develop appropriate mechanisms to address identified problems. Such mechanisms are likely to include procedural improvements, local plan changes, providing technical assistance to local governments, permitting and regulatory changes, and interagency coordination. The state also plans to complete regional periodic reviews in other areas of the coastal zone and to implement the Monterey Bay-area and statewide changes that have been recommended to date under the ReCAP Pilot Project.

DE Delaware will provide technical assessment capabilities for local governments to assist them with development of land use management plans that have resource protection and restoration as primary objectives. Delaware will also develop a public participation and technical assistance program for groups with vested interest in ecosystem protection and development.

ME To enhance municipal capacity to manage development, Maine will implement municipal technical assistance workshops and training, develop resource materials, and form an interagency technical assistance response team. The Maine Coastal Program will also encourage community dialogues about loss of community character and traditional economies and implement strategies to revitalize regional service center communities.

MD Outreach and technical assistance in Maryland will be linked to the Economic Growth, Resource Protection, and Planning Act, and will include direct technical assistance to local governments in drafting comprehensive plan sensitive area elements and implementing ordinances; workshops for local planners; and grants to local governments for completing sensitive area elements of local comprehensive plans and implementing ordinances.

MI Michigan intends to support local initiatives to develop, revise, and enhance local procedures or policies, including encouraging local assumption of state environmental protection statutes, and supporting revisions to or development of local master plans, zoning ordinances, and land use regulations to address the secondary and cumulative impacts of development.

MS Mississippi intends to develop marina siting and development guidelines. The state, together with other stakeholders, will undertake a Rural Wastewater Initiative to develop policies, plans and resources, and design recommendations that will enable local governments to expand the delivery of wastewater treatment capacity to the rural areas of coastal counties not currently serviced, regulated, or managed by an existing private or public wastewater organization.

NH New Hampshire will develop a prioritized list of needed educational resources. In addition, a video related to stormwater management and erosion and sediment control will be produced. This video will incorporate information on newly adopted Best Management Practices for stormwater control structures.

SC As part of its strategy to improve septic system maintenance and to implement site evaluation and design standards for large-scale and cluster onsite systems, South Carolina intends to develop a series of informational workshops for contractors and developers.

WA The state of Washington plans to approach cumulative and secondary impacts in the next three years by focusing first on updating Shoreline Master Program guidelines, developing pilot rules, fiscal impact analyses, and required State Environmental Policy Act documentation. Technical assistance materials for local governments will also be developed.

WI No Section 309 funding is allocated for cumulative and secondary impact projects; Section 306 funds will be used instead.

state activities 1992 to 1996

AS The American Samoa legislature is considering adopting mandatory compliance with the Uniform Building Code.

FL State water policy and the Florida water plan have been changed to address water supply, flood protection, floodplain management, water quality, and natural systems. Water management districts are required to establish minimum flows and levels for surface waters, spring flows, and aquifers.

BCDC As part of a Governor's initiative, the Commission changed a number of its regulations, including establishing a new abbreviated regionwide permit and increasing the types of activities that would quality for authorization through a regionwide permit.

ME The jurisdiction of the Maine Site Location of Development Law was changed in 1996 to decrease the state's role in permitting mid-sized development projects and increasing municipal responsibility for review of these projects. The legislature also enacted two new statutes strengthening the state's ability to address erosion control and stormwater management for new development. Other regulatory changes included addition of the state Endangered Species Act, which requires state approval for any project near designated essential habitat for an endangered species, to the core authorities of the coastal program, and changes to state Guidelines for Municipal Shoreland Zoning Ordinances.

MD The Economic Growth Resource Protection and Planning Act, passed in 1992, calls for local governments and the state to improve growth management and sensitive area protection, and to address community economic well-being. Local governments must revise their comprehensive plans to comply with the act. The Maryland coastal program has funded plan elements such as sensitive area inventories, modeling of growth scenarios, Geographic Information System mapping of sensitive lands, and development of plan elements. The act also established state policy and an interdepartmental procedure for reviewing state projects for consistency with that policy.

A statewide Smart Growth Initiative initiated by the governor includes a package of five bills introduced in the legislature.

The Riparian Forest Buffer Initiative, signed in 1996, will also enhance the state's ability to address cumulative and secondary impacts. The goal of the initiative is to protect forest buffers where they currently exist and to reestablish them where they have been degraded.

MA The Massachusetts Coastal Program boundary was expanded for the purposes of the Coastal Nonpoint Program, providing acknowledgment of the need to recognize watersheds as the operative unit for planning and evaluation purposes.

A stormwater advisory committee created performance standards and design criteria for stormwater controls, which will be implemented beginning in 1997 and incorporated into regulations within a year of implementation.

MI Several bills addressing land use issues were likely to be enacted: a subdivision control plat act and a purchase of development rights act.

MS New on-site wastewater disposal law includes provisions requiring the State Board of Health to adopt rules governing design, construction, installation, and operation and maintenance of onsite disposal systems for single family residences. The law also provides the Board of Health with the authority to

inspect systems, require repair, and apply penalties in certain instances. It also gives local governments the authority to adopt similar or more restrictive ordinances governing systems.

NH The state expanded the regulatory definition of developed waterfront property to include land contiguous to or within 200 feet of tidal waters that uses a septic system. At the time of sale of such property, the condition of these septic systems must be determined through a Tidal Water Site Assessment.

NY Amendments to the State Environmental Quality Review regulations were made in January 1996 to give full consideration to environmental factors, including cumulative and secondary impacts, during early planning stages of direct actions funded or approved by local, regional, and state agencies.

Several improvements have been made to enable municipalities to address cumulative and secondary impacts more effectively through their Local Waterfront Revitalization Programs. These include giving municipalities the authority to implement Harbor Management Plans (HMP) within their jurisdiction. The Harbor Management Plans, which are integrated with Local Waterfront Revitalization Programs, address impacts, including cumulative and secondary impacts, to particular water bodies. Since July 1992, eleven new Local Waterfront Revitalization Programs have been approved by OCRM, and two previously approved plans have been amended to better address cumulative and secondary impacts. HMPs have been developed or are in the process of being developed in at least eight communities.

NC Local land use planning guidelines have been revised to require local governments to assess present land and water uses on a watershed basis and to consider watersheds in developing local policies for growth.

In 1996 the North Carolina General Assembly enacted new legislation mandating the development of a general permitting program and monitoring requirements for animal operations.

OR Statewide land use planning goal 5 in Oregon protects Natural Resources. The goal was recently revised to provide riparian corridor protections that will positively affect the management of salmon habitat and coastal streams and estuaries in general.

PA A new initiative is underway in Pennsylvania consisting of three laws that address unused industrial sites. The legislation intends to enable such locations to be reused for new industrial activity.

RI An inspection program for septic systems is under development, and alternate treatment systems are being assessed for regulatory approval.

The Coastal Resource Management Council adopted new buffer zone requirements to mitigate the cumulative and secondary impact of development in coastal areas.

SC Stormwater regulations have been revised and special coastal best management practices implemented.

VA Several new pieces of legislation, state programs, and state-supported but locally initiated projects that deal with nonpoint source pollution, habitat protection and restoration, citizen education, and pollution prevention have emerged since 1992.

USVI Rules and regulations have been established to provide guidance for activities that lead to cumulative and secondary impacts. The Environmental Protection Program rules and regulations have been revised to upgrade tier II requirements to the equivalent of those presently required by the territory's coastal zone management act.

New coastal zone permit applications that focus on preventing non-point source pollution were developed under the nonpoint source control program.

WA Washington passed a Growth Management Act in 1990, and the Growth Management Project, designed to respond to the act, has addressed cumulative and secondary impacts issues, including

development of model shoreline and coastal zone policies addressing cumulative and secondary impacts.

309 strategies

CA California plans to continue implementation of the ReCAP strategy by carrying out regional periodic reviews in additional areas of the coastal zone. The ReCAP framework will allow the Commission to assess the cumulative impacts of development on a range of coastal issues and develop appropriate mechanisms to address identified problems. Such mechanisms are likely to include procedural improvements, local plan changes, permitting and regulatory changes, and interagency coordination. The state also plans to implement the Monterey Bay area and statewide changes that have been recommended to date under the ReCAP Pilot Project.

CNMI The CNMI's cumulative and secondary impacts strategy is to develop policies, authorities, and modifications that will incorporate elements of the defunct CNMI zoning program into the coastal management program. The Coastal Resource Management Division already has the administrative capabilities of a permitting system, and the Division proposes to incorporate oning into this review. In general, large scale projects receive adequate review. The major gap in environmental review is of medium scale development and of any coordinated effort to address cumulative and secondary impacts.

GU Guam's cumulative and secondary impacts strategy focuses on assessment and management of soil contamination accumulated during past military and industrial use of harbors. A four-year project will identify levels of contamination in submerged soils, analyze toxic contamination, develop guidelines and legislation for curtailing additional toxification and for dredge spoil disposal, and develop procedures for reporting and analyzing cumulative and secondary impacts through the development review and permitting system of the Government of Guam.

HI The Hawaii cumulative and secondary impacts strategy is to develop new and revised authorities to carry out the programmatic recommendations of the coastal nonpoint pollution control program management plan. Changes may include new or revised statutes, administrative rules, ordinances, and regulations; and nonregulatory programs.

MA The priorities of the Massachusetts strategy for improving management of cumulative and secondary impacts are to develop and implement programs and standards to improve abatement of nonpoint pollution, to develop and implement a coastal monitoring plan, and to develop better abilities to track land use changes and manage water quality data.

ME Specific regulatory changes that will be pursued include creating administrative procedures and guidance to implement new laws for erosion and sedimentation control and stormwater management.

MI The Michigan strategy is to develop new state legislation that would amend zoning enabling acts to provide additional tools for local communities to manage and guide growth and protect coastal resources.

MS The state proposes development and implementation of a comprehensive urban nonpoint source management program that will include model ordinances for stormwater management, floodplain management, and erosion control.

NY The New York Coastal Management Program originally designated state parks, local waterfront revitalization areas, and estuarine sanctuaries as special management areas requiring development of detailed management plans. The coastal program proposes to expand the definition of special management areas to include areas or regions with distinctive and cohesive natural, recreational, industrial, commercial, ecological, scenic, or historic resources; areas with urban characteristics where shoreline and water uses compete or where concentrated uses are appropriate; and areas or regions that are subject to issues requiring attention beyond that provided for in the statewide coastal management program.

SC An element of the state's strategy is to conduct a feasibility assessment for developing and implementing a septic system maintenance program for local communities, to develop and adopt site evaluation and design standards for large-scale and cluster onsite systems in the coastal zone; and to develop a series of informational workshops for contractors and developers.

WA The state of Washington plans to approach cumulative and secondary impacts in the next three years by focusing first on updating Shoreline Master Programs guidelines, developing pilot rules, fiscal impact analyses, and required State Environmental Policy Act documentation. Technical assistance materials for local governments will also be developed. The pilot rule will also be field tested and monitored.

nonregulatory controls

state activities 1992 to 1996

AK The Kenai River Study, led by the Alaska Department of Fish and Game, was designed to assess and control cumulative impacts along the Kenai River. The project included a summary of nonregulatory mechanisms that could possibly be used to control these impacts and recommendations for a continued approach to assessing and managing cumulative impacts of development on fish habitat.

309 strategies

AK Alaska plans to continue and expand the Kenai River project described above and in the Alaska section.

CA California will initiate a second-generation assessment of growth in the Malibu/Santa Monica coast region. The ReCAP framework will allow the commission to assess the cumulative impacts of development on a range of coastal issues and develop appropriate mechanisms to address identified problems. Such mechanisms are likely to include procedural improvements, local plan changes, providing technical assistance to local governments, permitting and regulatory changes, and interagency coordination. The state also plans to complete regional periodic reviews in other areas of the coastal zone and to implement the Monterey Bay area and statewide changes that have been recommended to date under the ReCAP Pilot Project.

MD Maryland will use 309 funds to help develop and promote an array of incentives to maintain and restore forest buffers. Incentives may take the form of technical assistance, financial assistance, tax abatement, and regulatory relief. Changes in statutes, regulations, policy directions, and operations orders will be needed to enhance or establish successful incentive programs.

MS The state, together with other stakeholders, will undertake a Rural Wastewater Initiative to develop policies, plans and resources, and design recommendations that will enable local governments to expand the delivery of wastewater treatment capacity to the rural areas of coastal counties not currently serviced, regulated, or managed by an existing private or public wastewater organization.

coordination and reorganization

State Activities 1992 to 1996

BCDC The CALFED Bay Delta Program is a federal-state partnership to develop an integrated system to improve management of the natural and economic resources of San Francisco Bay and the Sacramento-San Joaquin River Delta. The interagency cooperative effort is addressing development of water quality standards, operations of the State Water Project and federal Central Valley Project, and development of long-term solutions to Bay-Delta estuary resource problems.

MD The Maryland Department of Natural Resources has initiated an effort to recognize the importance of ecosystem management at different levels through the preparation of a plan to improve integration of the resource management activities within its authority.

MA A Massachusetts Watershed Initiative has created a water resource decisionmaking framework. Basin teams with representatives from several state agencies have been established for the state's twenty-seven major watersheds to assess and evaluate water quality within each basin.

NJ The New Jersey State Development and Redevelopment Plan involves cross- acceptance by county and municipal governments of policies to guide future development. At the state level, agencies are working to coordinate the efforts of the Plan into their functional plans and regulatory responsibilities.

NC The North Carolina Division of Water Quality is implementing a basinwide approach to managing water quality, intended to improve efficiency, effectiveness, and consistency of the state's surface water quality protection program. Under this approach, all water quality programs including permitting, monitoring, modeling, nonpoint source assessments, and planning are coordinated and integrated by river basin.

OR The state of Oregon developed the Coastal Salmon Restoration Initiative, a plan for collaborative efforts among federal, state, and local agencies, watershed councils, industry, and citizens to restore native coastal salmon and trout populations in Oregon.

VA The Virginia Department of Environmental Quality was established in April 1993, bringing state expertise in air, waste, and water together in the same agency.

WA Washington passed a Growth Management Act in 1990, and the Growth Management Project, designed to respond to the act, has addressed cumulative and secondary impacts issues, including development of model shoreline and coastal zone policies addressing cumulative and secondary impacts.

309 strategies

AL Alabama proposes to develop and implement a strategy to coordinate existing monitoring programs for water quality, wetlands, habitat, and other factors, and to identify information needs and gaps and a strategy for sharing information.

BCDC The Commission will continue to work closely with its Long Term Management Strategy partners to prepare the final Environmental Impact Statement for the program, with a focus on preparing the comprehensive management plan for implementation of the program. BCDC will also remain involved in the CALFED program.

obstacles and needs

AL *Public understanding***:** There is a need for greater public education regarding causes and effects of cumulative and secondary impacts.

AK *Research needs:* Knowledge about complex ecological relationships and carrying capacities of various resources is inadequate.
*Assessment methods***:** Accurate and standardized assessment methods and predictive models for cumulative impacts are lacking.
Permitting criteria: Adequate criteria for permit decisions are needed.
Funding: Funding is needed for monitoring, enforcement, and training. Further, the cost of obtaining legally and scientifically defensible data is high.
Management commitment: Upper management commitment to addressing the issue of cumulative and secondary impacts is needed.

AS *Existing development patterns:* Traditional patterns of development, combined with the heavy American influence of recent decades, have led to a low-density/land-intensive approach to development and a lack of employment centers outside the main harbor area, combined with a high growth rate, shrinking land base, and lack of sufficient infrastructure.
Management tools: Certain management tools are lacking, such as effective and culturally appropriate community planning, consistent compliance with building codes, reliable population data, long-range planning; management mechanisms that provide effective guidelines and policy capable of creating the quality of society for which the territory is striving.
Data collection and analysis: There is a need for regular integration of data collection and analysis throughout the government.

BCDC There is a need to develop a Geographic Information System (GIS) resource and permit monitoring system to enable the Commission to map areas that are high priority for development of a GIS. The Commission could work with the Regional Water Quality Control Board and local governments to curb impacts of development outside of the Commission's jurisdiction through watershed planning. The BCDC should work more closely with the State Lands Commission on leases on trust properties.

CA *Legislative and financial support:* Legislative and financial support are needed for carrying out the ReCAP program and for analyzing buildout projections and their probable cumulative impacts throughout the coast.
Legal authority: Authority is needed for the California Coastal Commission to require amendments to local coastal plans or to provide incentives for local governments to amend their plans based on commission recommendations.
Collaborative planning/coordination: Strategies are needed to link local coastal program improvements to the increasing number of watershed planning and management and growth management efforts within the state but falling outside the coastal zone as designated under the California Coastal Management Program.

CNMI *Legal authority:* Inadequate authority arising from lack of a zoning program for the Commonwealth and from limitation of the coastal program's jurisdiction to review major projects or projects located outside an Area of Particular Concern (APC) or the major siting designation hinder the ability to address cumulative and secondary impacts in the CNMI.

CT *Information needs:* The most significant need is not for additional regulatory authority but for development and dissemination of additional information based on GIS and other data capabilities and focusing on sensitive resources, activities with high potential to cause cumulative impacts, and locations where the combination of resources and activities requires more targeted management.
Need for methodologies: Resource information systems that would permit a more sophisticated management approach than simply to avoid, minimize, and mitigate each incremental impact.
Program integration: Continued work is needed on integrating nonpoint source pollution control into ongoing programs.

DE *Inadequate infrastructure:* Lack of sufficient infrastructure in small coastal communities to accommodate growth.
Inadequate land use controls: Lack of adequate land use controls and other planning mechanisms to accommodate and control growth

FL *Baseline data:* Baseline data against which future cumulative and secondary impacts can be compared are lacking for many parameters. The subtlety of the causes of impacts is problematic in attempts to document impacts.
Public perception: It is difficult to convince the general public and policy makers that each small incremental development contributes to overall significant impacts.

GU *Baseline data:* Baseline data on environment, impacts of military actions, impacts from shipping and boating practices are inadequate.
Public understanding: Public understanding of development impacts to the environment needs to be improved.

HI *Baseline data:* There is a shortage of baseline data, sustainable capacity data, and resource value data; further, existing GIS data is not readily accessible, and is incomplete or outdated in many areas; monitoring of environmental indicators is also inadequate.
Legal authority: The land use regulatory scheme in the state has become outmoded in some areas; the state environmental impact review statute and regulations do not adequately address cumulative and secondary impacts.
*Governmental coordination***:** There is a lack of coordination among permitting, regulatory, and management agencies with respect to policies regarding tourism promotion and growth and resource protection and management.
Political will: There is a lack of political will to engage in meaningful land use and growth management planning.

LA None

ME *Research needs:* Effectiveness of BMPs that control stormwater quality has not been tested in Maine.
Need for new management approaches: The current approach to managing development, relying on town-by-town planning and regulating individual projects, is limited in its ability to deal with cumulative impacts of development on a watershed scale. The state lacks guidance to consider past and future development in a coastal town or watershed when permitting a specific development project. State needs to develop a watershedbased program that links towns and people with the information they need.
Need for local capacity building: Many of Maine's coastal municipalities lack the technical capacity to manage growth and regulate development—need training, information, and personnel to conduct technical reviews of development projects.

MD *Need for technical/financial assistance to locals:* Because the Economic Growth, Resource Protection and Planning Act offers considerable flexibility to local governments, there is a need to continue offering incentives and direct assistance in preparing sensitive area plan elements, and a need to assure proper development of sensitive areas protection ordinances and effective implementation of such ordinances.
Need for redirection of resources/funds for acquisition: The Smart Growth initiative has identified the need to infill and improve urban areas by aggregating and redirecting state resources to qualifying neighborhoods for conservation or restoration purposes; the need to contain sprawl by working with local jurisdictions to identify priority service areas; the need to secure rapid protection of large contiguous areas and of open space and green networks before development patterns lead to fragmentation and land and easement prices rise beyond the point of public affordability.
Data needs: An objective of the Maryland Coastal Bays Program is to promote ecologically sound, sustainable development, but building a consensus on what that goal entails would be facilitated by data on factors such as the total cost of development, the value of tourism, and the value of the region's resources.

MA *Inadequate data:* Data gaps continue to exist.

MA *Inadequate analytical methods:* Analytical methods are still problematic in some instances.
Public education: Public acceptance and local implementation are still not sufficient, but the coastal nonpoint plan provides a blueprint for ongoing future efforts.

MI *Public understanding:* The public perception that environmental protection and planning are impediments to economic development needs to be addressed.
Planning: There is a lack of integrated land use planning in the state.

MS *Data Needs:* The lack of consistent water quality monitoring information is a significant gap.

NH *Funding; enforcement; political will:* There is a need in the state for resources, education, and motivation to enforce local regulations that require stormwater and erosion/sediment controls. Development projects below the minimum size threshold for state review are reviewed only under local regulations. These regulations vary from place to place in content and the extent to which they are enforced. Developing and funding a circuit rider position for the coastal region would help resolve this situation.
Public education: The coastal program needs to assist in disseminating information about septic system operation and maintenance, and the water quality impacts of malfunctioning systems, to all coastal homeowners.

NJ *Boundary:* The location of the existing coastal zone boundary makes it difficult to address impacts within a watershed but outside the regulatory boundary.
Governmental coordination: There is a need to develop mechanisms to involve all levels of government in the assessment and decision making framework of coastal management.
Data: Quantitative and trend data on coastal resources is lacking, as is data that can be used to differentiate the cumulative and secondary impacts of development, and data to track the effectiveness of regulatory controls.

NY Not Addressed in assessment

NC *Methodology*: An approach to cumulative and secondary impacts designed to minimize impacts of individual projects on important coastal resources is not adequate where high concentrations of development have occurred or will occur.
Legal authority: The Coastal Resources Commission has yet to exercise its authority to deny permits for development on the basis of cumulative effects. The Division of Coastal Management continues to develop rules for consideration and minimization of cumulative impacts in high risk areas or areas of sensitive resources.
Data and analysis needs: Gaps in data and analytical methods include resource impacts from Coastal Area Management Act (CAMA) permits and other permits; geolocation of permitted projects; identification of cumulative impact high risk areas; and methods for assessing and predicting cumulative impacts..

OR None

PA *Inadequate comprehensive planning:* Consistency is not required between local plans and their implementing regulations in Pennsylvania, and comprehensive plans developed by counties are only advisory in nature.
Regulatory coordination: No authoritative mechanism exists for dealing with projects of regional impact, and consistency is not required between plans of neighboring areas.
Resource limitations: Professional staffing is limited.

PR *Inadequate baseline data:* The commonwealth lacks a systematic compilation of baseline data for coastal and aquatic resources, and systems for compiling information are antiquated.
Lack of interest by management: Several commonwealth agencies have not demonstrated much interest in developing capabilities for cumulative and secondary impact review.
Information exchange: Although numerous states and territories are developing procedures for addressing cumulative and secondary impacts, opportunities to exchange information on the topic are lacking.

RI None

SC *Information needs:* The most significant need is for an adequate information base and geographical understanding on which to base decisions. Evaluating activities on a case-by-case basis is not an adequate management method for dealing with cumulative and secondary impacts. A big picture type analysis, coupled with early review and an expanded understanding of direct and indirect, long-term and short-term, impacts of activities will be required to protect coastal resources adequately. Such an understanding can be accomplished through a better basic understanding of resource capacities and limitations, coupled with the ability to examine potential impacts through a coordinated, comprehensive process.

USVI *Enforcement:* Need better enforcement of existing policies.

VA *Growth management*: Controlling growth is primarily the realm of local government comprehensive planning, but local planning tends to steer development rather than control it in ways that reduce cumulative and secondary impacts on coastal resources.

WA *Regulatory reform:* There is a need to complete work begun in response to regulatory reform amendments requiring integration of the original Shoreline Management Act and the 1990 Growth Management Act. This integration will involve workshops for local government, drafting of technical assistance papers, developing model text for integration of the acts, internal education, and internal and external (local government) amendment and permit review guidelines.
Habitat loss: An emerging issue in Washington is the cumulative and secondary impact of development on embayments of Puget Sound; these impacts manifest themselves in chronic habitat loss in the ecotone between the Puget Sound uplands and the marine waters of Puget Sound.

WI *Public education:* There should be continued support for public information and education initiatives. Local government regulatory staff, planning and building inspection officials should have access to educational seminars on cumulative impacts of development decisions. Continued effort should be directed toward the creation of a certification program for staff and local officials. Regional meetings should be established to consider cumulative and secondary impacts of development in specific coastal areas that encompass multiple political jurisdictions.
Regulatory reform: State programs and statutes must be continued to be reviewed to determine if impacts other than just water quality should be incorporated.

appendices

SUMMARY TABLE
CZMA Section 309 Assessments and Strategies
Cumulative and Secondary Impacts Enhancement Area

STATE	ASSESSMENT		PLANNING		INFORMATION MANAGEMENT		TECHNICAL ASSISTANCE		REGULATORY CONTROLS		NON-REGULATORY CONTROLS		COORDINATION & REORGANIZATION	
	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy
Alabama				%		%	$	%						%
Alaska	%%%%% %%%%%	%%									%	%		
A. Samoa		%	$	%					$$					
BCDC			$	%					$				$	
California	%	%		%	%$		$	%		%		%		
CNMI	%%									%				
Connecticut	%	%	$$		$	%								
Delaware	%	%	$$	%	$			%%						
Florida	%$		$$		$$				$					

STATE	ASSESSMENT		PLANNING		INFORMATION MANAGEMENT		TECHNICAL ASSISTANCE		REGULATORY CONTROLS		NON-REGULATORY CONTROLS		COORDINATION & REORGANIZATION	
	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy
Guam		%	$$					%		%				
Hawaii	%$		$$							%				
Louisiana	%$%				%									
Maine			%$$	%			$	%	$$	%				
Maryland			%$				$	%%	%$$			%	$$	
Massachusetts	$$	%	$			%		%	$$	%			%	
Michigan	%%		%					%	$	%				
Mississippi				%%			%	%%	%	%		%		
New Hampshire	%	%%	%$$			%		%	%					
New Jersey			%$$	%	%								$	
New York			$$%	%					%$$	%				

STATE	ASSESSMENT		PLANNING		INFORMATION MANAGEMENT		TECHNICAL ASSISTANCE		REGULATORY CONTROLS		NON-REGULATORY CONTROLS		COORDINATION & REORGANIZATION	
	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy	• s since ›92	Current 309 Strategy
North Carolina		%	%		%	%	%		%$				%	
Oregon			$						$				$	
Pennsylvania	%		$	% SAMP					$					
Puerto Rico	%	%			%	%								
Rhode Island			$$$						$$					
South Carolina		%%			$		$	%	%%%	%				
USVI				%					$$					
Virginia			$$$	% SAMP					$				$	
Washington								%	%	%			%	
Wisconsin							$							

Key to symbols:
T 309
$ Non-309

U.S. Department of Commerce
National Oceanic and Atmospheric Administration • National Ocean Service